

MANUFACTURERS RECORD

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A Weekly Newspaper Devoted to the Industrial, Financial, Railroad,
Mining, Contracting, Engineering, Building, and General
Business Interests of the South and Southwest

Vol. 66
No. 9

ESTABLISHED 1882

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Single Copy 15 Cents

Bear Ye One Another's Burdens.

This Divine Command must be heeded now. It would be folly to shut our eyes to the tremendous losses which the world must meet. Untold billions in wealth are being swept away, and untold billions in men, more precious in value than all material things—young men, strong, clear-minded, the very fullest fruition of Europe's civilization are being destroyed. The financial loss is overwhelming in magnitude, and the loss in manhood through suffering, disease and death, the loss in all the higher and holier attributes of man no human mind can grasp and no human pen can ever tell.

This loss must be widely distributed that the world may stand the shock. Every man in this country must bear his share of the burden or else be a burden shirker. Here and there exceptional conditions may yield exceptional results, but in one way or another, the farmer must carry his part of the load, the merchant his and the manufacturer his. Money-making for the sake of money-making must give way to maintenance of business, that people may be given employment and that every business interest may be ready to go forward on a large scale when the time comes, as surely it will, for big money-making. Men must learn to bear each other's burdens; the banker must realize that this is no time for calling loans; the borrower must strive to the utmost of his ability to pay his loans in part, at least; the manufacturer, the merchant and all others must do what they can for the common good, content if they can carry their share of the world's burden and be ready to do business for money-making when conditions make ready for a great burst of activity.

Face to face with the horrors such as civilization has never known, the most awful toll that death has ever claimed, men must be sobered by this glimpse into the very gates of hell, and strive to be less selfish and more ready than ever before to bear one another's burdens.

The burden can be carried if thus properly distributed, and if this be done we shall be made ready for the day of activity when the sunrise of coming prosperity begins to flood the hills.

BALTIMORE, SEPTEMBER 3, 1914

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let us know what you need.

Illustrated catalog M awaits your request.

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New Haven, Conn.

(54-56)

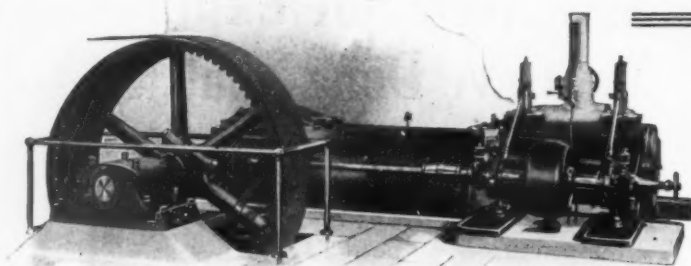


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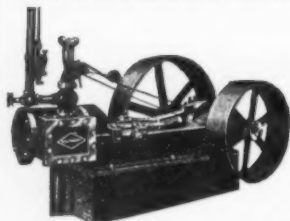
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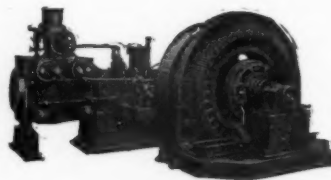
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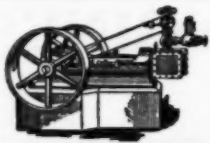


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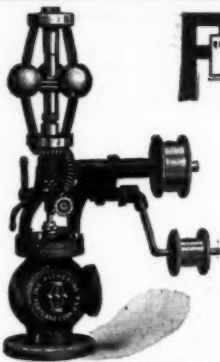
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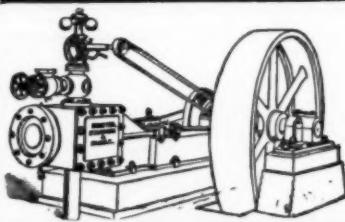
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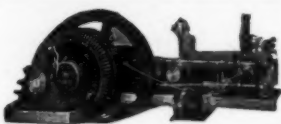
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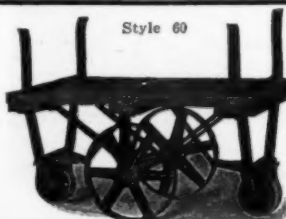
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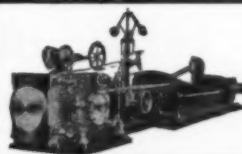
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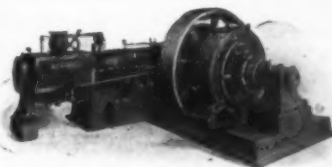
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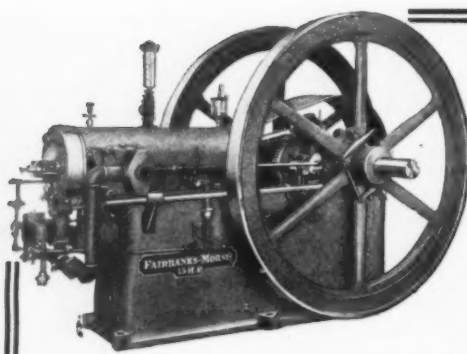
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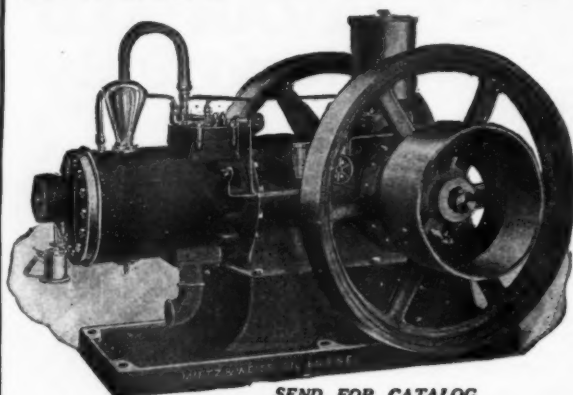
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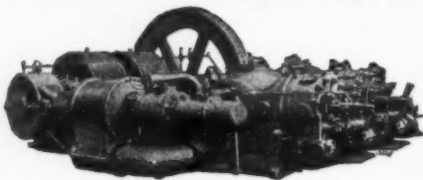
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The Snow Oil Engine is best for all grades of oil fuel

Fully described in Bulletin No. S110-29, which will be sent you on request. You will be particularly interested in what we have to say regarding the advantages of this type of engine on page 5 of Bulletin.

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It will reduce your power bill; It is simplicity itself; Its service is reliable; There is no smoke; No auxiliaries are required.



50 to 1500 H. P.

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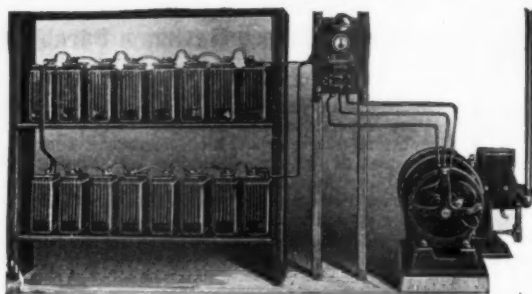
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S-136.1

ELECTRIC LIGHTS FOR COUNTRY HOMES AND BUILDINGS



This shows the direct connected gasoline engine and dynamo, the switch board and battery.

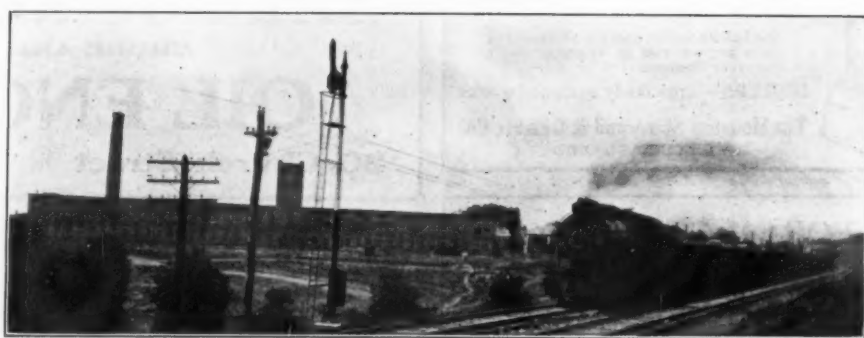
Every home and store in small towns need electric light.

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The owner recognizes the need of modern methods in lighting. Write for booklet.

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GOOD LIGHTING!

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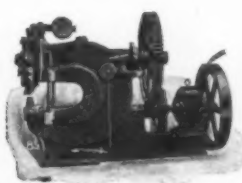
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Coffee Mill.



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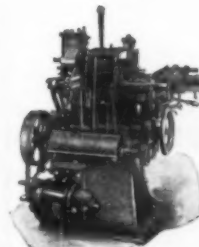
The Robbins & Myers Company makes a
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They will be glad to work
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Monotype Caster.

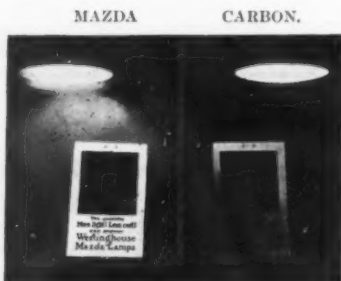
THE ROBBINS & MYERS COMPANY Springfield, O.

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When buying incandescent lamps—



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Westinghouse Mazda Lamps

provide a sufficient quantity of good quality light at the minimum cost so as to enable each workman to do the maximum amount of work. The new improved type of Mazda lamp in sizes from 400 to 1000 watts gives nearly six times as much light as the old style Carbon lamps for the same amount of current. In the smaller sizes Westinghouse Mazda lamps are from three to four times as efficient as the old style lamps. In other words, you can get from three to six times as much light in any part of your plant without increasing the current consumption.

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*Westinghouse Lamp Corporation.

Distributors of McCandless
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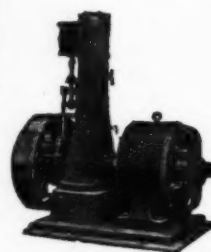
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Built Compact and Sturdy. All sizes from 4 to 25 K. W. Get full details.

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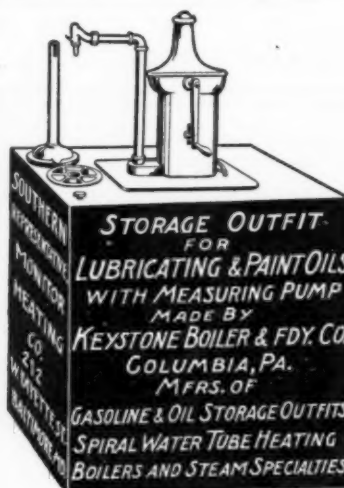
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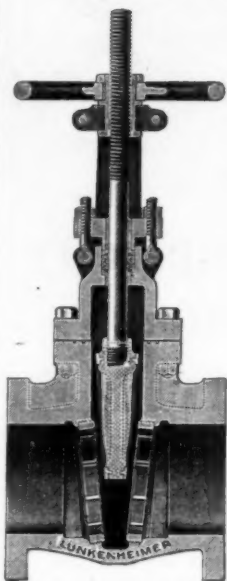
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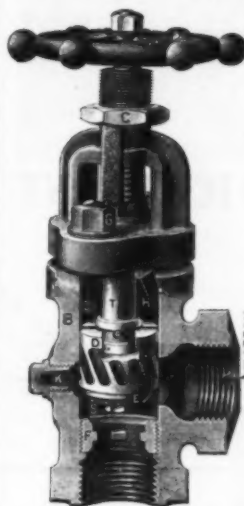
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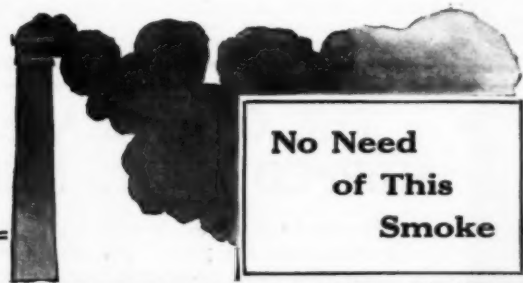


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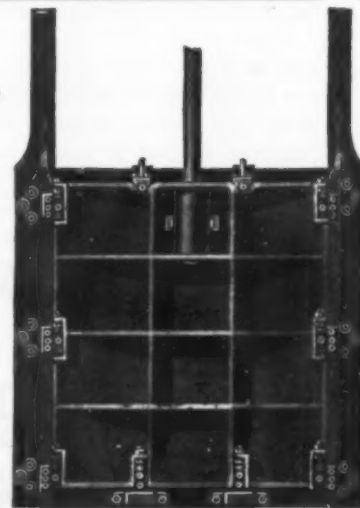
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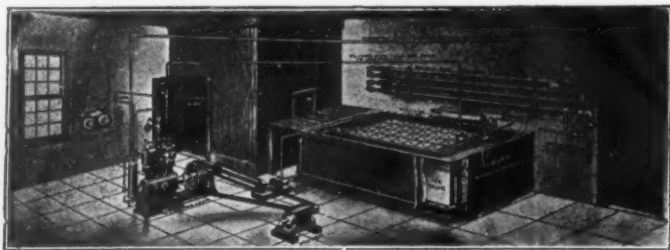
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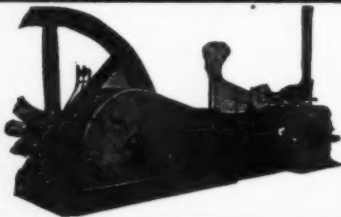
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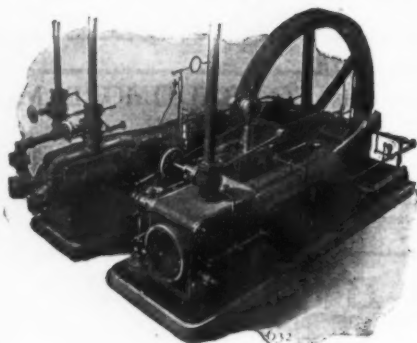
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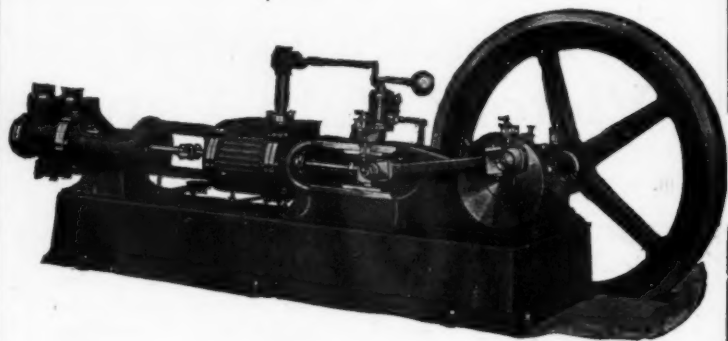
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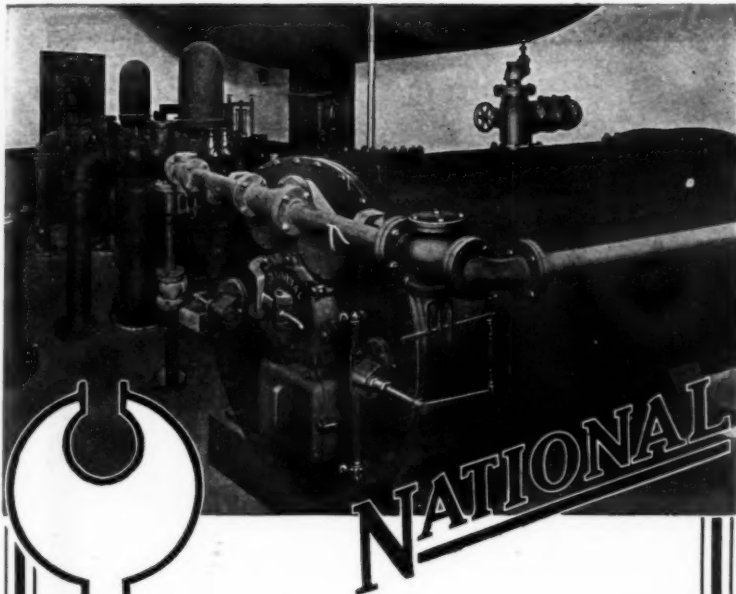


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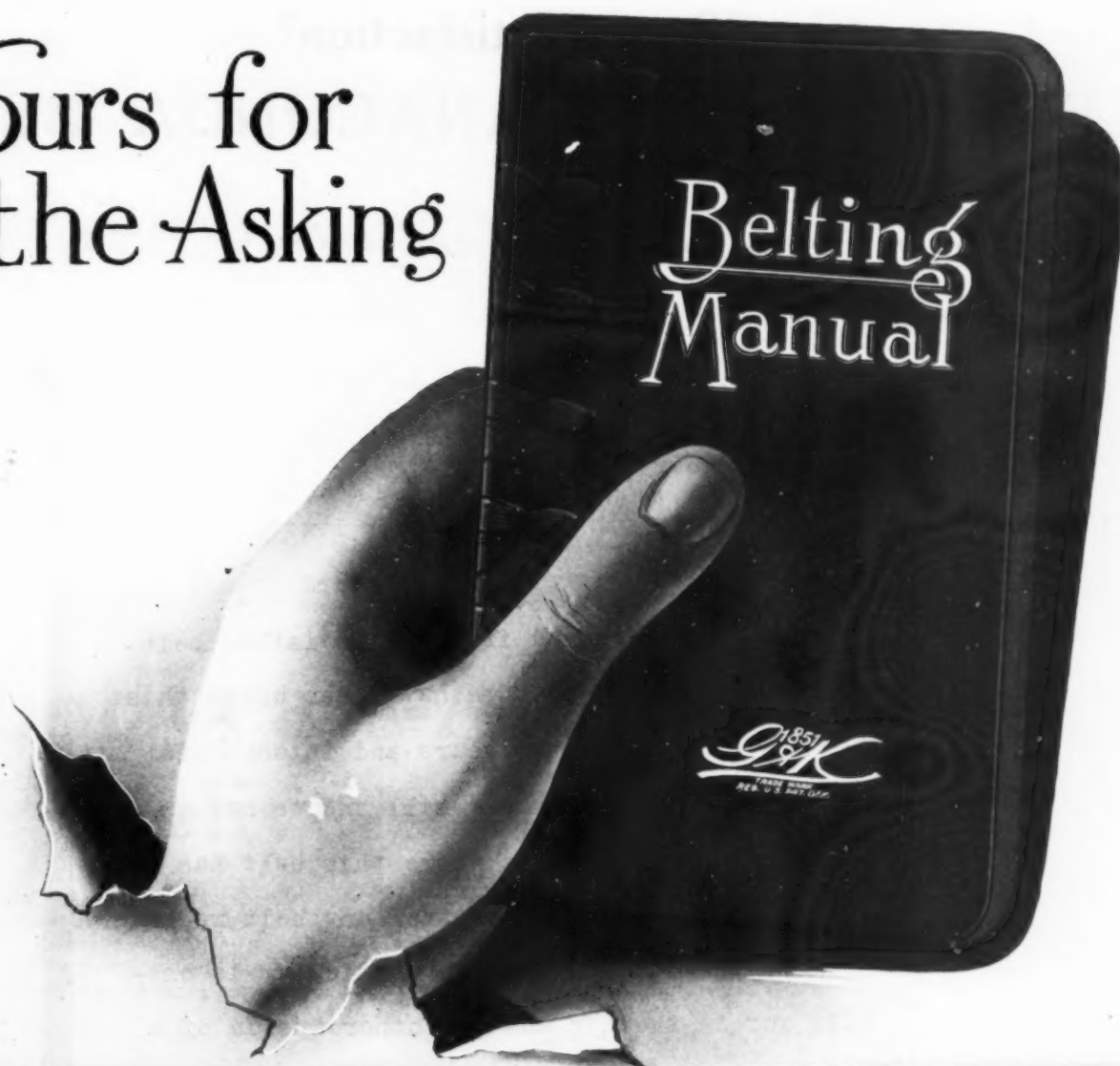
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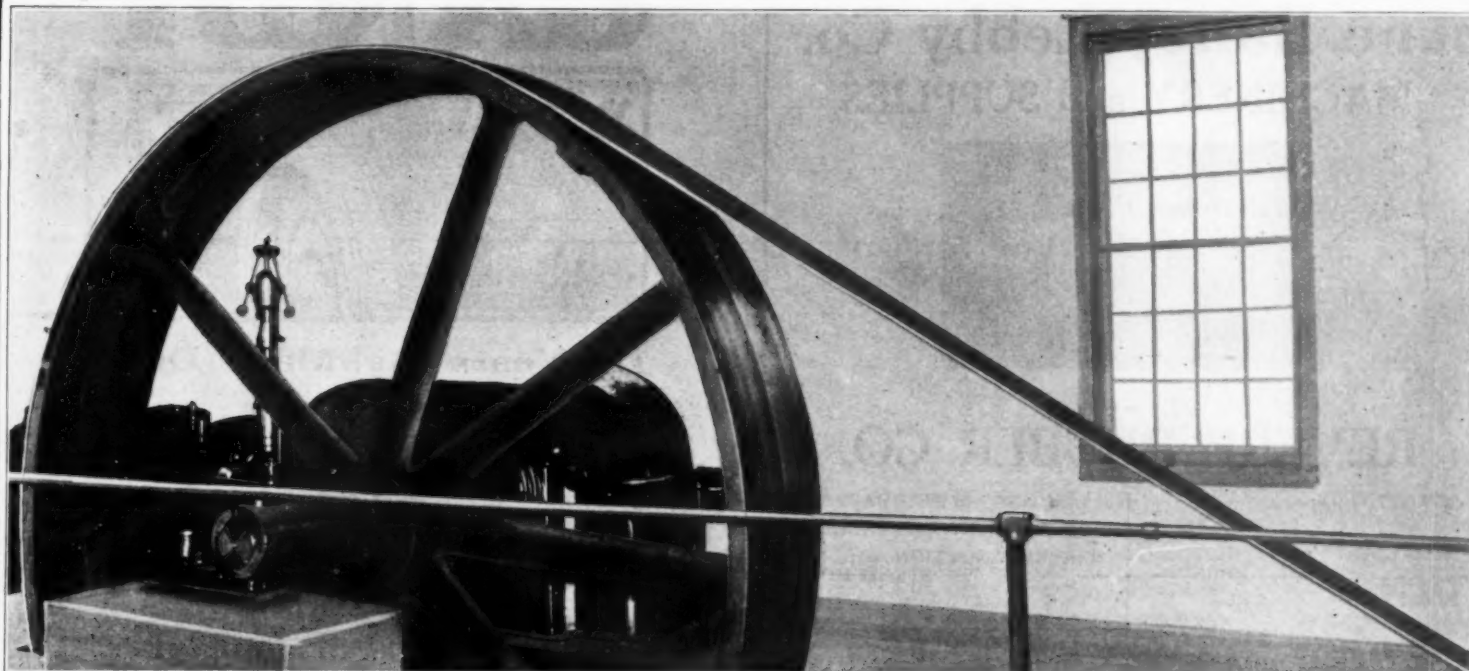
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If power equipment were bought on a price basis alone, many brands of belting would now be far outselling Goodyear-Akron.

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Only the fact that Goodyear saves "*after*" dollars could account for this stupendous growth—this overwhelming preference. Let us submit the facts. Learn what Goodyear efficiency will do for you. Our experts will gladly give you the benefit of their massed experience on any of your belting problems.

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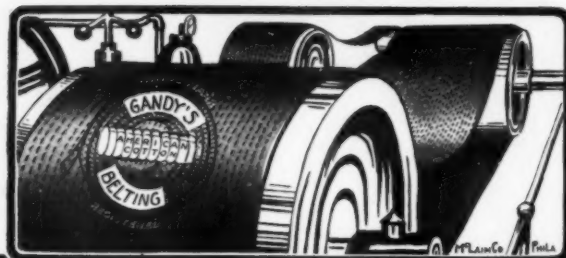
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"THE FOOS MFG. CO., Springfield, Ohio."

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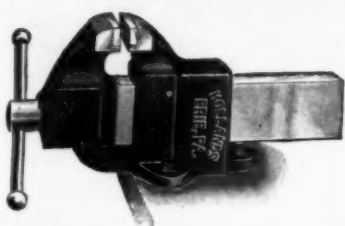


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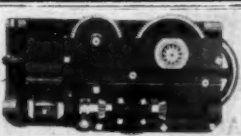
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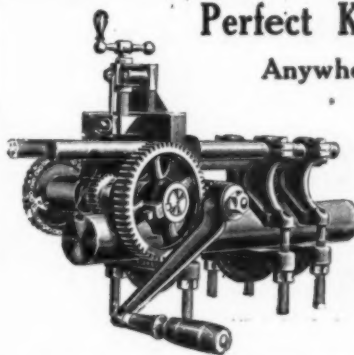
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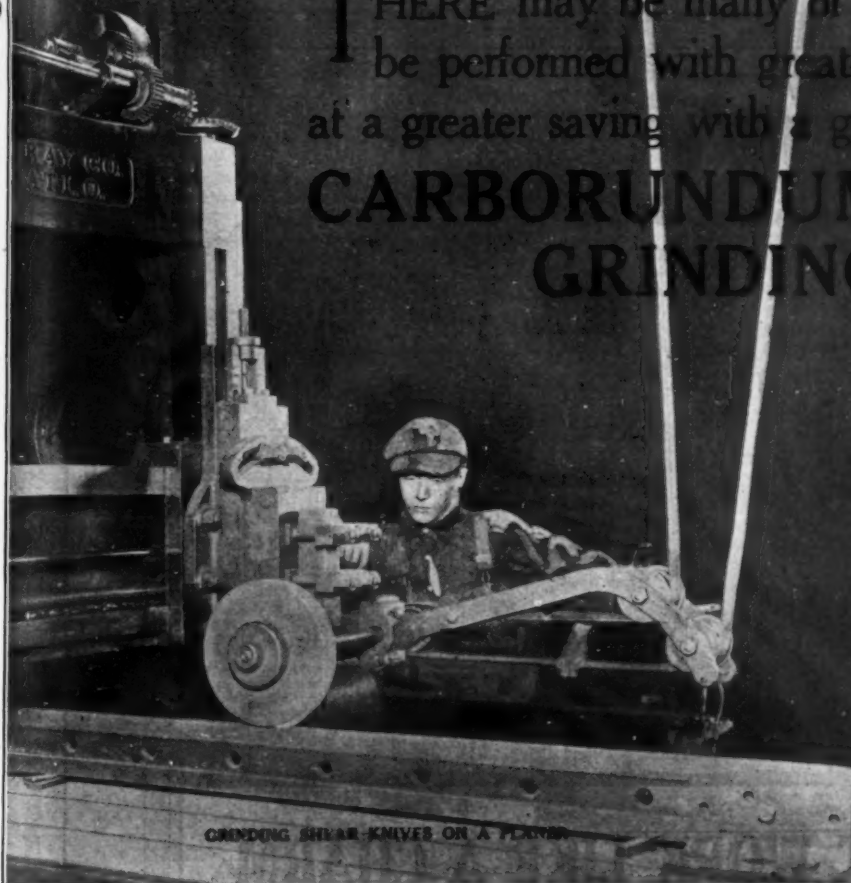
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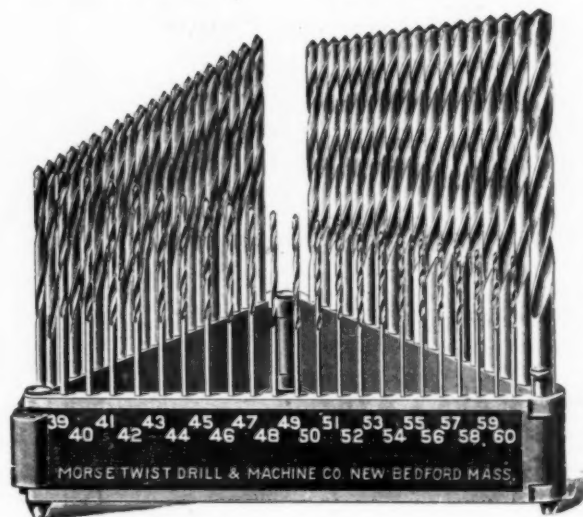
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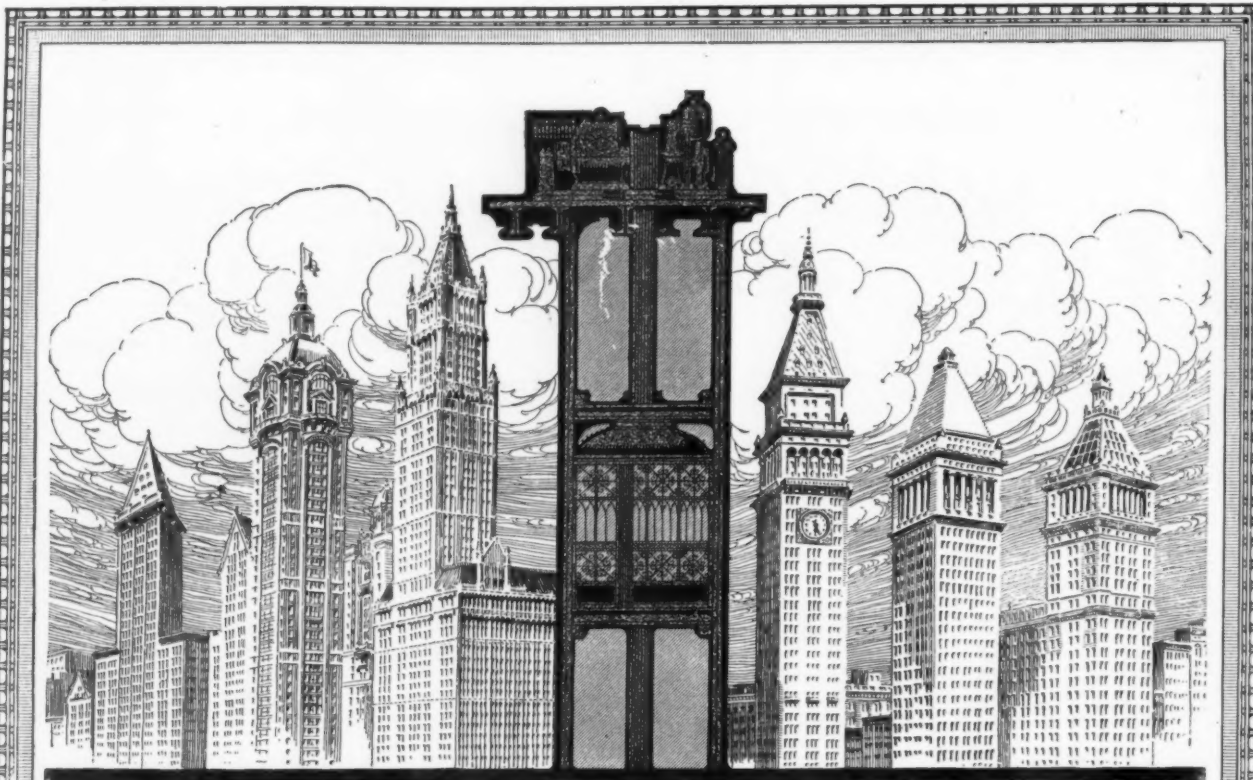
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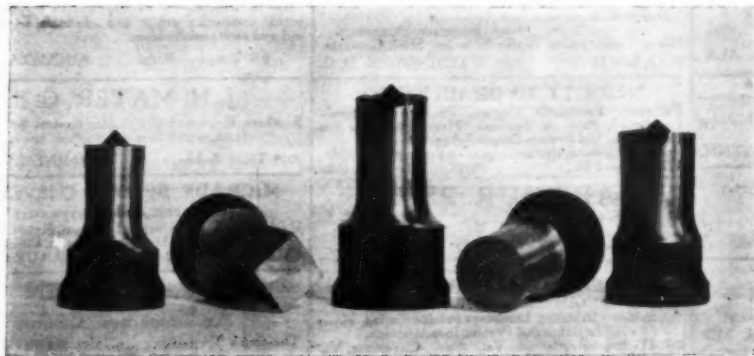
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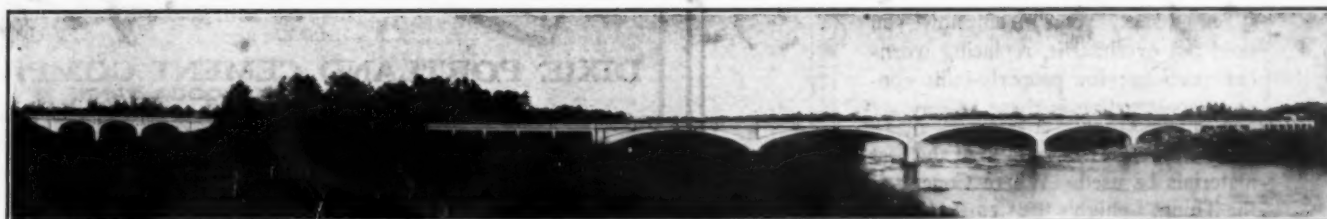
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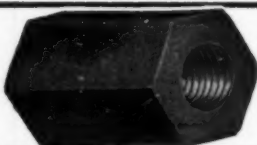
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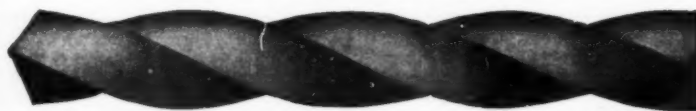
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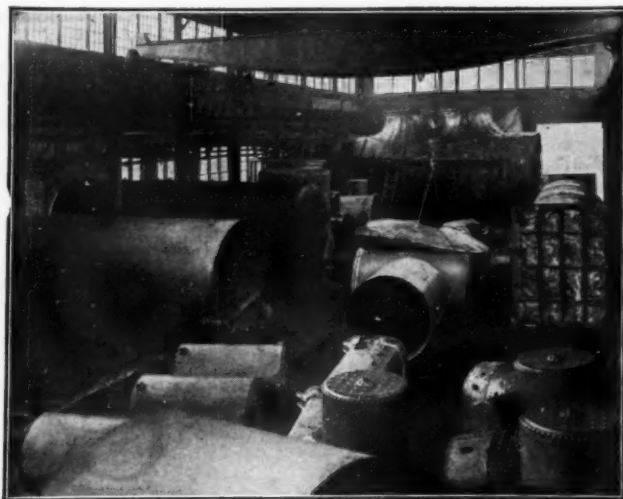
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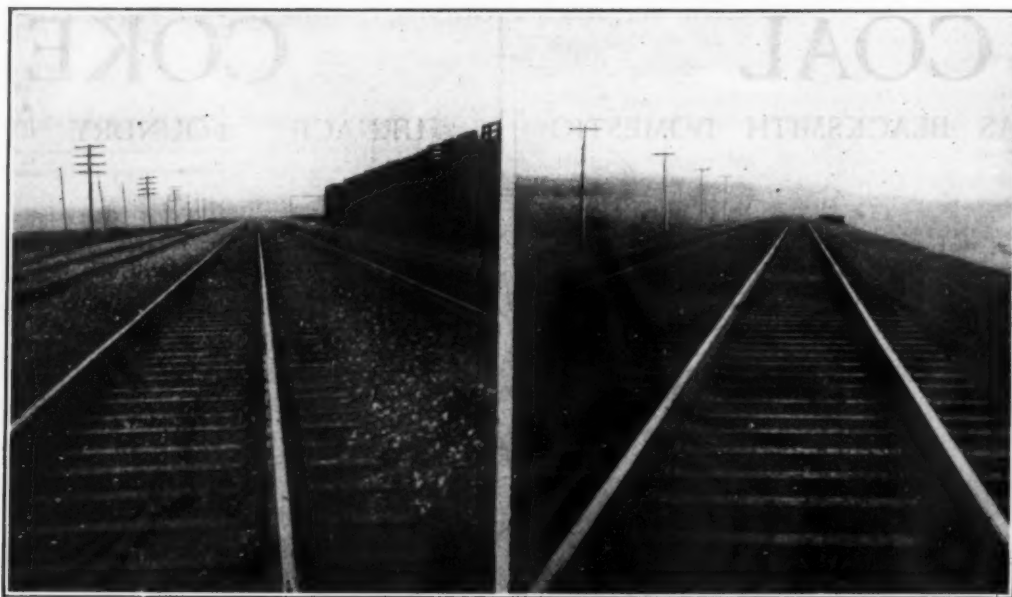
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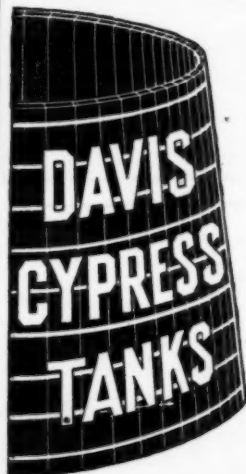
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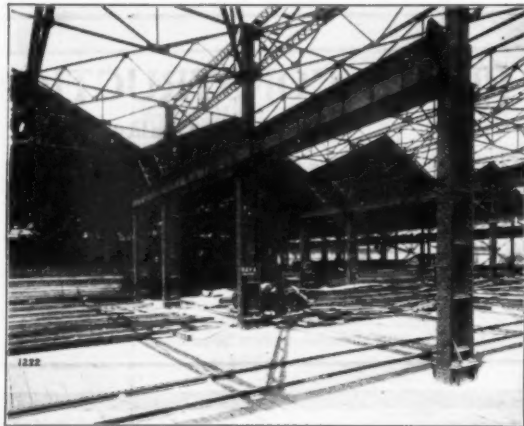
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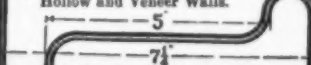
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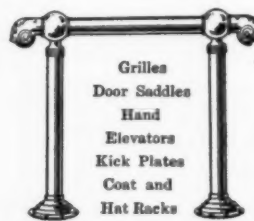
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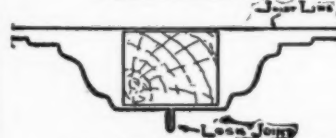
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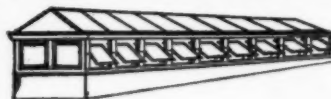
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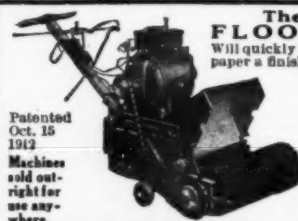
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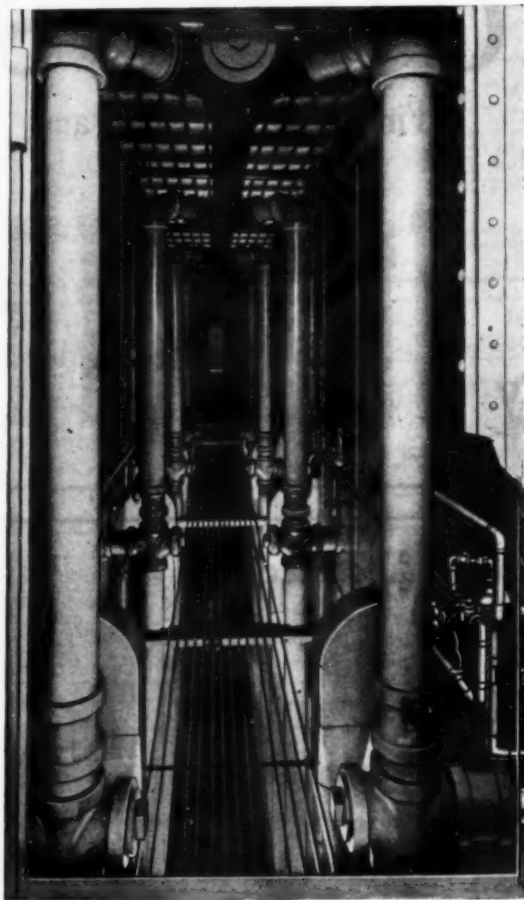
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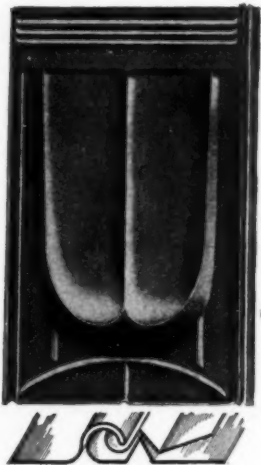
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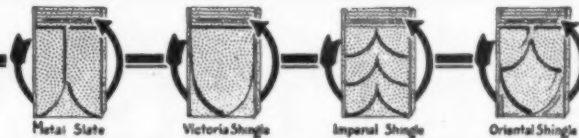
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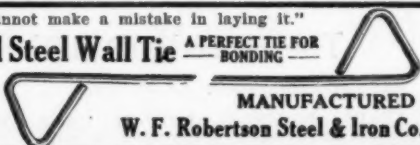
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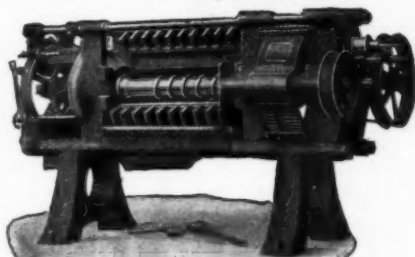
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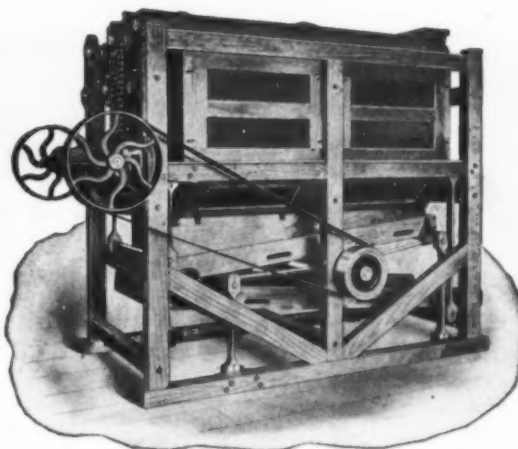
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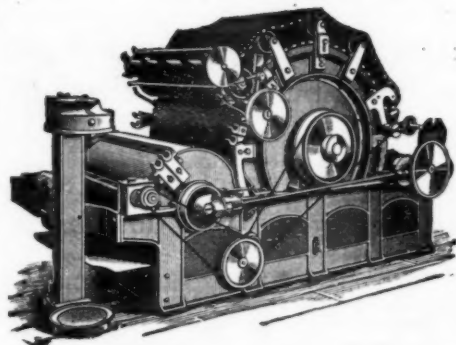
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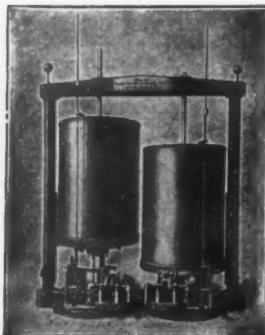
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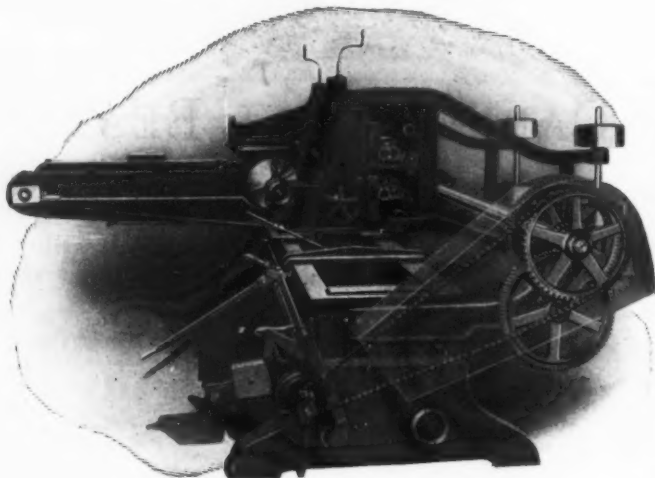
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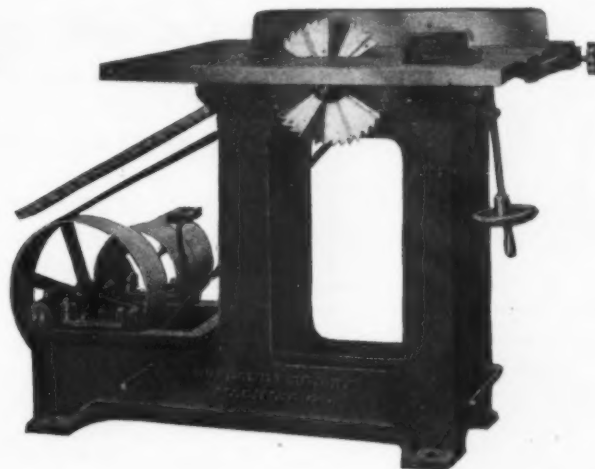
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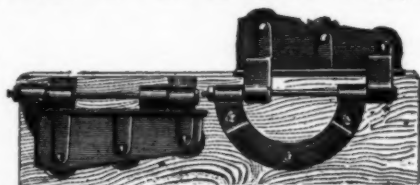
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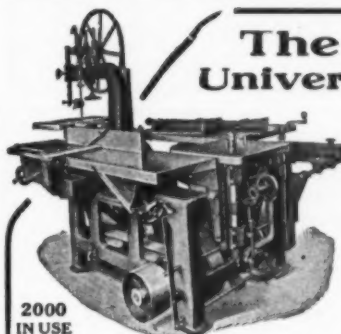
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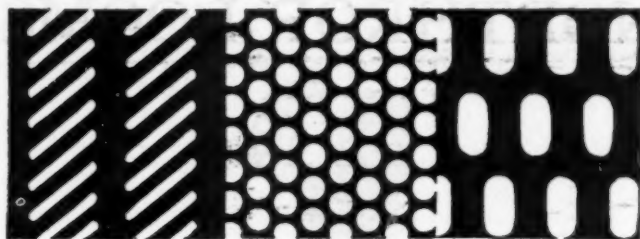
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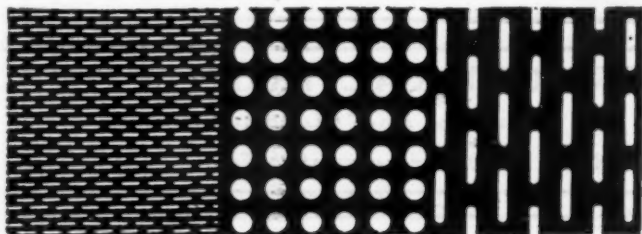
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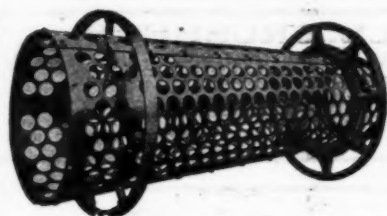
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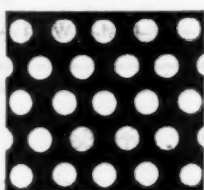
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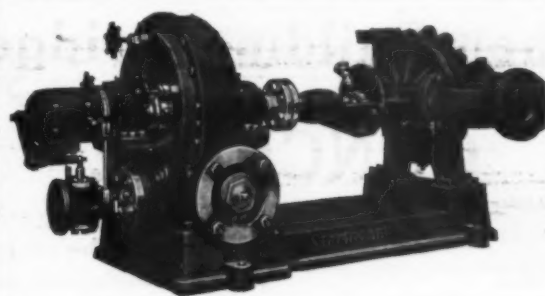
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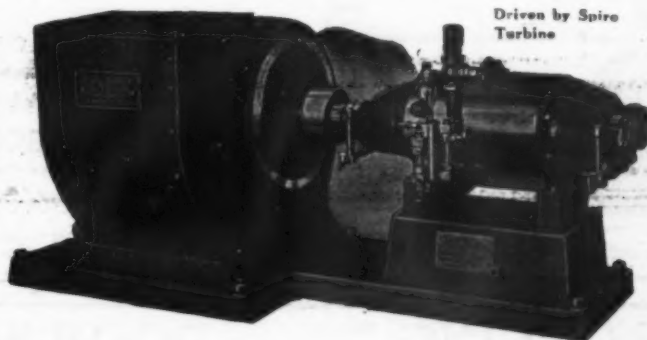
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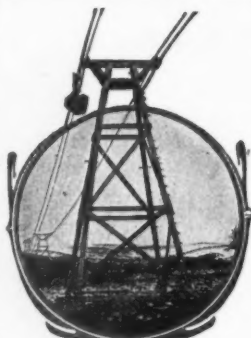
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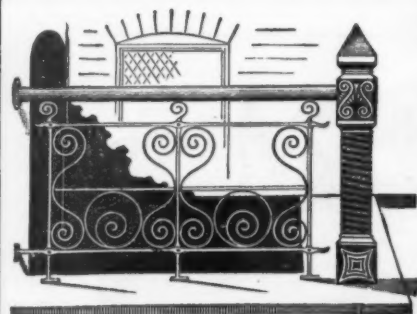
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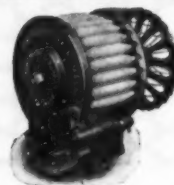
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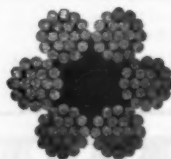
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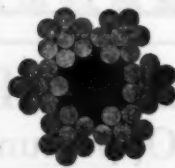
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MANUFACTURERS RECORD

A WEEKLY SOUTHERN INDUSTRIAL, RAILROAD AND FINANCIAL NEWSPAPER

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THIS issue of the MANUFACTURERS RECORD is published in two sections. Part I is the regular weekly issue, and Part II covers a broad story of the upbuilding work in progress in Baltimore.

Since the great fire, ten years ago, some hundreds of millions of dollars have been expended in broad constructive work in the rebuilding of Baltimore. The story of how this has been done and of the work now in progress is of vital interest to every business man, and this story appears in full in Part II of this issue—BALTIMORE: AS IT WAS; AS IT IS; AS IT WILL BE.

OUR COUNTRY'S BOUNDLESS POSSIBILITIES.

ONE hundred million people, better fed, better clothed and better housed and with more advantages for business, more resources for agricultural and industrial progress, more educational and religious opportunities, more freedom from entangling alliances than any other people in this or any other age have known, live in the most wonderfully endowed country on earth.

They own 40 per cent. of all the railroad mileage of the world, though they number only one-sixteenth of the world's population.

They produce more than one-half of the world's coal, and have such vast resources upon which to call that it may be said that their coal is almost limitless in extent.

They produce more than 40 per cent. of the iron and steel of the world, more than half of its petroleum, 60 per cent. of its cotton and 75 per cent. of its sulphur.

They live in the best located country, geographically considered, on earth, and they have no standing armies of millions at their border lines forever threatening war and ruin.

They can produce foodstuffs enough when the time demands it to support five times their present population, the cotton and the wool with which to clothe these people, and the raw materials for industries to employ them.

To the north of their country these one hundred million people have a friendly Anglo-Saxon land of ten million people who must become ever-increasing consumers of many of their manufactured products.

To the south of them these one hundred million people have Cuba, with its immense wealth made this year out of sugar; Porto Rico and many other islands, and Mexico, which, with peace, will doubtless begin to rebuild on a large scale its industrial

and commercial activities, and Central and South America, a mighty continent of mighty possibilities, whose buying and selling must now of necessity be largely forced to the United States.

The non-coal and iron and steel producing countries of the world must seek our coal and iron and steel, since they can no longer look to Europe. The cotton-goods-buying nations who have heretofore looked to the 100,000,000 spindles in Europe for their supplies must perforce now turn to the mills of the South and of New England. The hardware and machinery buyers of these southern lands who have helped to enrich Germany and France and Belgium and England, with trade running annually into many millions, can now fill their needs nowhere else on earth except in the United States.

We may mourn beyond words to express over Europe's pall of woe and feel a deep sorrow at its loss of trade, but we will be doing civilization's work by stretching every nerve to expand our trade and commerce, for in so doing we shall be strengthening the whole fabric of all civilization.

Nothing worth having is easily won. We need not expect to conquer new trade without a strong and continuous effort, but the possibilities of an empire of business to be won are so vast as to justify a long and determined work to win a prize of such might and power.

RAISE FOODSTUFFS.

LIVE men must eat, no matter what else may happen. Food must be had for one hundred million population of this country, with much to spare for another hundred million, at least, in the countries now at war.

Only one European country among those now working mutual destruction of the ordinary means of living produces enough food for itself, even in time of peace. Whatever may be the outcome of the war, there will be an immediate demand for food, a demand that will increase the longer war is waged, a demand that is likely to end the war.

With all channels of supplies from outside closed, with half a dozen nations in the condition of beleaguered fortresses, the condition rapidly taking form in Europe, we may look for a simultaneous movement in all the countries by the men and women not in the fighting ranks for enough food to keep them alive. They will not ask why food is scarce; they will not hesitate to take it wherever it may be found.

The armed forces may possibly be compelled to turn their weapons against their own people in riot and rapine unparalleled in history.

Famine will put an end to fighting. Then will come the call upon this country for food. If we have abundance, the call will be answered, with no distress on our part. If we have a shortage, or if we have only sufficient for our own necessities, the response to the foreign demand will be made at the expense of our own people. We must have no shortage.

We must plant corn, using corn generically for foodstuffs. Our farm possibilities have by no means been exhausted. The United States has 1,141,800,000 acres of land suitable for tilled crops and 361,570,000 acres suitable for non-tilled crops. We are tilling only 312,000,000 acres, something more than one-fourth of the possibilities, and little of our tilled area is producing up to its potentialities. The present emergency is the opportunity for a return in this country from town to country. Forehanded farmers are to be the busiest class of producers in this country during the next two or three years. Let all possible attention, North, South and West, be centered upon producing foodstuffs.

THE SOUTH'S LUMBER CUT.

NOTWITHSTANDING the general tendency to a diminution in the cut of lumber in this country, the high mark having been reached in 1909, when the output was 44,585,000,000 feet, the South continues to increase its proportion of the total. Last year it cut 21,532,683,000 feet, or 56.1 per cent. of the total cut of 38,387,000,000 feet in the United States. There was a decrease in the 1913 cut from that of 1912 of 74,836,000 feet in the South and of 606,000,000 feet in the rest of the country. The cuts by States in the South in the two years are compared in the following table:

States.	1913.	1912.
Alabama	1,523,936,000	1,378,151,000
Arkansas	1,911,647,000	1,821,811,000
Florida	1,055,047,000	1,067,525,000
Georgia	844,284,000	941,291,000
Kentucky	541,531,000	641,296,000
Louisiana	4,161,560,000	3,876,211,000
Maryland	140,469,000	174,330,000
Mississippi	2,610,581,000	2,381,898,000
Missouri	416,608,000	422,470,000
North Carolina	1,967,258,000	2,193,308,000
Oklahoma	140,284,000	168,866,000
South Carolina	752,184,000	816,930,000
Tennessee	872,311,000	932,572,000
Texas	2,081,471,000	1,902,201,000
Virginia	1,273,953,000	1,568,997,000
West Virginia	1,249,559,000	1,318,732,000
Total	21,532,683,000	21,607,519,000
United States	38,387,000,000	39,158,414,000

Fifteen States cut more than 1,000,000,000 feet each in 1913. Eight of them were Southern States, which cut 15,743,541,000 feet, or 73 per cent. of the total Southern cut. Among all the States of the country Louisiana ranked second in the cut, Mississippi third, Texas fifth, North Carolina sixth, Arkansas seventh, Alabama eighth, and Virginia tenth. Only ten States made an increase over 1912. They were Washington, Louisiana, Mississippi, Oregon, Texas, Arkansas, Alabama, Montana, Arizona and Rhode Island, five of them Southern. The increases were principally in the Douglas fir on the Pacific coast and yellow pine in the South.

THE SOUTH AND THE RIVERS AND HARBORS BILL.

IT seems hardly likely, according to reports at Washington, that the proposition to postpone action on the rivers and harbors bill will be accepted by the Congress. But, in view of the imminence of legislation imposing extraordinary taxation to meet a decrease in Federal income intensified by the war in Europe, it is possible that the bill may be so changed as to provide only for undertakings now under way that cannot be suspended without loss. In such an event, which would turn upon the conviction that even the effect of the war does not justify neglect of the ordinary activities of our Government, what part is the South likely to play in relinquishing temporarily hopes in the interest of the general welfare?

The pending rivers and harbors bill, as it passed the House of Representatives on March 26 last, carried appropriations for harbors and other waterways of the South aggregating \$23,129,624, an increase over the appropriations made by the preceding Congress of \$1,600,000. In June the Senate committee on commerce reported the bill so amended that the appropriations for the Southern waterways had been increased, by additions here and reductions there, to \$24,883,224, divided among the Southern States and

among enterprises hardly to be classified on State lines, as follows:

Alabama	\$1,025,500
Arkansas*	1,083,150
District of Columbia	95,000
Florida	603,200
Georgia	763,250
Kentucky†	25,000
Louisiana	664,500
Maryland	309,400
Mississippi	490,000
Missouri	2,036,500
North Carolina	686,675
South Carolina	87,000
Tennessee	1,693,515
Texas	2,435,000
Virginia	604,534

Total	\$12,502,234
Inland waterways‡	3,381,000
Mississippi River	9,000,000

Aggregate.....\$24,883,234

*Includes Oklahoma. †Includes West Virginia. ‡Including \$25,000 for removal of water hyacinths from streams in Florida, Alabama, Mississippi, Louisiana and Texas.

The several projects by States and the amounts at present apportioned in the bill are as follows:

Alabama.	
Mobile harbor	\$125,000
Mobile Bay	30,000
Alabama River	100,000
Black Warrior, Warrior and Tombigbee rivers	750,000
Tombigbee River	20,500
Total	\$1,025,500

Arkansas.	
Red River	\$150,000
Ouachita River	691,500
Saline River	3,000
Arkansas River	164,700
White River	31,500
Cache River	3,000
Black and Current rivers	33,150
St. Francis River	6,000
Total	\$1,083,150

District of Columbia.	
Potomac River	\$30,000
Anacostia River	75,000
Total	\$95,000

Florida.	
Fernandina harbor	\$25,000
Tampa Bay	6,000
St. Lucie Inlet	50,000
St. Petersburg harbor	1,500
Apalachicola Bay	25,000
St. Andrews Bay	60,000
Santa Rosa Sound	5,000
St. Johns River	300,000
Lake Crescent and Dunns Creek	1,000
Deep Creek	9,000
Caloosahatchee River	2,000
Crystal River	10,000
Anclote River	22,000
Withlacoochee River	1,000
Apalachicola River	15,000
Holmes River	3,000
Blackwater River	5,000
Clearwater harbor to Tampa Bay	22,700
Choctawhatchee River	25,000
Escambia and Conecuh rivers	15,000
Total	\$603,200

Georgia.	
Savannah harbor	\$404,000
Brunswick harbor	33,250
Savannah River	25,000
Altamaha, Oconee and Ocmulgee rivers	75,000
Flint River	25,000
Chattahoochee River	120,000
Coosa River	81,000
Total	\$763,250

Kentucky.	
Big Sandy River	\$25,000
Total	\$25,000

Louisiana.	
Southwest Pass, Mississippi River	\$400,000
Bayou Teche	130,000
Vermilion River	37,500
Bayou Terrebonne	25,000
Atchafalaya River	10,000
Lake Pontchartrain	22,000
Bayou Grossetete	9,000
Johnson's Bayou	5,000
Bayous Bartholomew, Macon, D'Arbonne and Corne, and Boeuf and Tensas rivers	16,000
Total	\$604,500

Maryland.	
Curtis Bay channel, Baltimore harbor	\$123,700
Herring Bay and Rockhole Creek	11,800
Rock Hall, Queenstown, Claborne and Cambridge harbors, Chester, Choptank, Warwick, Wilcomico, Pocomoke, La Trappe and Manokin rivers and Tyaskin Creek	30,500
Breton Bay	3,000
Corsica River	4,800
Elk and Little Elk rivers	2,500
Tuckahoe River	1,500
Chester River	12,000
Tred Avon River	19,600
Total	\$209,400

Mississippi.	
Pascagoula harbor	\$110,000
Gulfport harbor	85,000
Pascagoula and Leaf rivers	14,000
Pearl River	16,000
Yazoo River	10,000
Vicksburg harbor	125,000
Yazoo River and tributaries	40,000
Big Sunflower River	90,000
Total	\$490,000

Missouri.	
Osage River	\$15,000
Gasconade River	21,500
Missouri River	2,000,000
Total	\$2,036,500

North Carolina.	
Cape Lookout harbor of refuge	\$300,000
Beaufort harbor	5,000
Beaufort Inlet	10,000
Morehead City harbor	2,000
Meherrin River	1,000
Roanoke River	2,000
Pembroke Creek	10,000
Scuppernon River	33,300
Fishing Creek	1,000
Pamlico and Tar rivers	18,500
Bay River	1,000
Contentnea Creek	2,000
Smith's Creek	2,000
Neuse and Trent rivers	37,000
Swift Creek	500
Northeast, Black and Cape Fear rivers	38,375
Cape Fear River	206,000
Shallotte River	1,000
Bennett River	6,000
Deep Creek	4,570
Newbegin Creek	5,000
Total	\$686,675

South Carolina.	
Little Peedee and Lumber rivers	\$2,000
Great Peedee River	10,000
Orangeburg to Charleston	35,000
Santee, Wateree and Congaree rivers	40,000
Total	\$87,000

Tennessee.	
French Broad River	\$23,515
Tennessee River	1,080,000
Cumberland River	590,000
Total	\$1,693,515

Texas.	
Galveston Channel	\$300,000
Port Bolivar Channel	25,000
Port Aransas	800,000
Sabine Pass	550,000
Sabine River	30,000
Houston Ship Channel	200,000
Anahuac Channel, Trinity River, Oyster Creek, and Cedar, Chocolate, Turtle, Bactrop, Dickinson, Double and East Bay bayous	25,000
Mouth of Brazos River	25,000
Brazos River	275,000
Pass Cavalle to Port Lavaca	5,000
Aransas Pass to Corpus Christi	15,000
Trinity River	255,000
Cypress Bayou	5,000
Colorado River	25,000
Total	\$2,435,000

Virginia.	
Norfolk harbor	\$270,000
Mattaponi and Pamunkey rivers	7,000
Rappahannock River	10,000
Nansemond River	7,500
James River	200,000
Appomattox River	5,000
Blackwater River	2,000
Coast waterway	1,000
Hampton Creek	27,000
Tangier Channel	16,434
Oyster Channel	11,500
Lockies Creek	4,100
Ocoquan Creek	43,000
Total	\$604,534

In Connection with Inland Waterways.	
Purchase of Chesapeake & Delaware Canal	\$2,250,000
Norfolk to Beaufort Inlet	600,000
Norfolk to North Carolina sounds	3,000
Charleston to Winyah Bay	5,000
Charleston to Savannah	50,000
Savannah to Fernandina	6,000
Pensacola Bay to Mobile Bay	50,000
East Coast Canal	10,000
Mobile Bay to Mississippi Sound	10,000
Mobile Bay to Mississippi River	25,000
Mississippi River to Bayou Teche	100,000
Bayou Vermillion and Mermentau River	12,000
Texas inland waterway	235,000
Total	\$3,356,000

Some of these streams flow through more than one State or between States, such as the Red River in Arkansas, Louisiana, Oklahoma and Texas; the Escambia-Conecuh in Florida and Alabama, the Coosa in Georgia and Alabama, the Tombigbee in Alabama and Mississippi, the Tennessee in Tennessee and Alabama, and the Big Sandy in Kentucky and West Virginia. In such cases the stream has here been credited to one State only.

The appropriations mentioned do not include \$1,608,000 for the Mississippi, from the mouth of the Missouri to the upper stretches; \$350,000 for the Missouri, between Kansas City and Sioux City, or \$3,350,900 for the Ohio, each of which has some direct or indirect bearing upon the South's waterways facilities. Nor do the appropriations include the authorization of contracts amounting to \$1,826,000 for the Cape Lookout harbor of refuge.

Those included in the pending measure are largely for the maintenance or continuance of work under way, involving such undertakings as linking up portions of the proposed inland waterway along the Atlantic coast and of that along the Gulf coast; the construction of the harbor of refuge at Cape Lookout, North Carolina; completing construction of Dams 4 and 5 in the Coosa River in Alabama; locks and dams in the Black Warrior, Warrior and Tombigbee system in Alabama; the utilization of water-power in the Tennessee River between Brown's Island and the railroad bridge below Florence, Ala.; the construction of eight locks and dams in the Ouachita River, Arkansas and Louisiana, and the work of wide and long-sustained scope in the Mississippi and its principal tributaries.

HOW TO GET A MERCHANT MARINE.

IT is to be hoped that the United States Government will not be so badly advised as to buy any of the big passenger steamers now in American waters. To do so would be unwise from every point of view. We do not need such steamers; we could not use them to advantage, and to buy them would be to prove ourselves easily worked for the benefit of the owners of these idle boats. What we need is freight boats, ocean tramps, ready to take a cargo or bring one to or from any port of the world, and perhaps a few passenger and freight boats for regular service to South America, but no great big expensive steamers beyond our present requirements. And then we need to build our own ships and thus develop our own shipyards, and this we can only do by paying subsidies. We shall do this sooner or later. Why not now and save time?

DON'T WORRY.

PERCHANCE your business may not be as brisk as you desire; maybe your cotton is selling for less than you expected, or you may be paying more for flour and sugar than a few weeks ago; possibly the bank wants you to pay a loan, but in the broader light of world affairs what matter such small things as these? You have health and a home, and you are not being rushed away from your loved ones to engage in the world's greatest slaughtering operations for the purpose of killing some unknown man who has never done you any harm, and whose death means overwhelming sorrow and poverty of widow and orphans, before he gets a chance to kill you and thus leave your loved ones to endure till the end of life the same sorrows and poverty. The larger the

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number killed, the greater the praise won. When you contemplate these things, isn't it a little beneath your manhood to fret over slow business and small profits while you think of the inferno in which Europe is living—no, in which Europe's people are dying?

IMMIGRATION FOLLOWING THE CLOSE OF THE EUROPEAN WAR.

IMMIGRATION to the United States has invariably increased in the past sixty-odd years following the ending of great European wars. The mightiest of such wars is now in progress. Hence, the people of this country may as well begin now to prepare to solve the problem of dealing with the millions of Europeans who will seek to enter the United States, no matter what the conclusion of the war may be. Among these millions will be vast numbers of individuals whose entrance cannot possibly be of the slightest benefit to America. To meet their cases restrictions upon immigration of undesirables should be emphasized at once. There will be other vast numbers turning their faces this way in hope of escaping for all time the horrors of war banked upon desperate efforts of Governments to maintain themselves against the obvious and unmistakable march of human events, and in determination to become part and parcel of the American people. Among these will be agriculturists, mechanics and other producers, for whom there will be a strong and wide call here. To meet their cases restrictions upon the immigration of desirables should be removed at once. About the greatest of these restrictions is the prohibition of the coming to this country of foreign-born under contract to work for any particular person or interest. That prohibition is a political sop to a limited element in this country, one of the bits of special-class legislation which has cursed the immigration policy of this country for many years. Evasions of the prohibition by another limited class have contributed largely to the economic disturbances of recent years and to the hostility of special classes among employers and employed.

But immigration can be made to advantage all classes. The pressure of population from abroad, as soon as the war throws upon the world millions of men demoralized by battlefields and cast loose temporarily from their wonted pursuits of peace, will give the United States the opportunity so to modify its immigration laws as to benefit itself and the rest of the world as well.

For the moment war has suppressed the discontent, some of it reasonable, some of it menacing to civilization, which in the past ten or twelve years has led several European Governments to provide facilities or to resort to devices for transferring to the United States their social problems. The record of the results of such European diplomacy and economics are the seething masses of aliens in congested groups in our large cities. Europe's social problems will be intensified by the war and during the war. The United States has sufficient of its own. Its immigration laws should be amended to check for all time the game of European Governments.

At the same time the laws should be amended to permit a selection by individuals and interests of this country, under proper governmental supervision, either State or National, of desirable immigrants to be directed under the valid assurance of employment to quarters where they will be needed. The less that Government has to do with directing the distribution of immigrants after they have landed here the better will it be for everybody concerned. The selection and the arrangements for distribution should be made abroad under supervision there of our Government, but allowing to individuals or corporations seeking workers as much freedom as may be compatible with the best interests of this country.

It will take time to determine all the details of such a plan. Now is the accepted time to begin. There is likely to be opposition in some quarters. Appeal must be made to broad-mindedness and to the sense of the mighty part which this country is to play in bearing the burdens of civilization in consequence of the European war. Two fundamental errors must be corrected—one, that there is only a limited amount of work to be done, and, therefore,

that any increase in the number of workers means decreased earnings for all; the other, that the amount of wages paid workers is to be fixed, not by what the worker contributes to the value of a product, but by the minimum amount with which a worker may be content. In these two errors are born the antagonisms of wage-payers and wage-earners. They must be eliminated for the solution of our immigration problem which the results of the European war will make more pressing than ever before.

ACTION NEEDED TO MEET PRESENT SITUATION.

NOT since 1865 has the South had a finer opportunity to show the stuff of which it is made and to demonstrate to the world the inherent strength of character and the initiative of its people. It has produced a cotton crop which will probably be the largest it has ever raised at a time when the world's demand must necessarily be much below the normal. Every business interest in the country is at the moment watching the South to see how it will meet this situation and how quickly it will formulate and put into effect plans to market this crop to the best advantage, and to carry on its business interests undismayed by the conditions developed by Europe's war. By the achievements of the next few months the South will be judged. Are its people equal to the situation? Will they measure up quickly to it and demonstrate that out of threatened disaster they can win victory? Or will they lose the opportunity to accomplish these things?

The situation is unique. It calls for broad leadership and for an unselfish devotion to all the interests of all the South. It is a time which demands real common-sense constructive work, recognizing all of the dangers and opportunities of the situation. It is a time for action rather than for talk. Rightly handled, the whole atmosphere can be promptly cleared and a spirit of optimism created everywhere. The South must recognize that in this world-wide disaster it cannot at the moment secure such a price for cotton as the growers had anticipated. Each individual man must meet these conditions, and without any misunderstanding or misconception of the reality of the present situation do his best to overcome them. Co-operation on the part of merchants and bankers and manufacturers ought to be developed now as never before, and if this sudden change in the cotton market outlook should drive home the lesson that Southern farmers must produce their own foodstuffs it will be worth the cost in the long run.

The South has great resources in minerals not now utilized, or utilized only to a small extent. It has great chemical-making possibilities; it has large stores of pyrites ores, vast supplies of sulphur, almost limitless beds of salt; it has manganese and a thousand and one other things which offer opportunities for careful investigation with a view to seeing if the time has come for the establishment of new industries to utilize them. Reckless investments in unwise ventures would prove alike unprofitable to the capitalist and to the South, but the time is opportune for a broader study of all these industrial potentialities than has ever been given the situation. Every chemist in the South ought to be intelligently studying the possibilities of the raw materials with which he is acquainted. Every manufacturer ought to be investigating the possibilities of producing new goods for new markets. Every effort should be made to develop in this section enterprises which will provide of home-made goods a large proportion of the things which we have been importing. We have been too dependent upon other countries; we have looked to them for too many of the products which enter into manufacturing when we ought to have been busy discovering how to make these things in the South.

If the cotton situation turns the thoughts of the farmers to a large increase in the production of grain and livestock and other foodstuffs that there may come about the widest agricultural diversification, and if it turns the attention of others to a more complete investigation of the potentialities of this section for broader industrial interest based on natural resources, then the South will be able to gather

itself together and go forward to a greater progress and prosperity than even that which it had anticipated for this fall.

ADVERTISERS ADVERTISING BALTIMORE

THE advertising pages of the illustrated Baltimore edition, published as Part II of this week's issue of the MANUFACTURERS RECORD, are of hardly secondary interest and importance to the reading matter itself, and will well repay the most careful perusal. Many of them are pitched in a key in harmony with the dominant tone of this entire effort—an expression of the spirit which is powerfully at work here now—and they thus amplify and round out the story of Baltimore's remarkable advancement. Throughout, and taken as a whole, the advertisements are the expression of a reawakened, vigorous Baltimore and a demonstration of its equipment for a vastly greater expansion.

These pages deserve to be studied also because of the interest they contain for business men everywhere who are concerned in methods that help to make for more business and for better business. Notable, furthermore, is the extent to which space has been used in this number by Baltimore business houses and by manufacturers and others from other cities who have had a part in Baltimore's development, forming an example of most commendable enterprise and aggressiveness at a time when business is depressed. Both in the wholesome tone of their announcements and in the size of spaces taken they set an example of American push and progressiveness that is inspiring.

Mention may be made of some typographical features which have contributed to the strikingly artistic appearance of the publication. There has been used throughout these advertising pages, and, in fact, throughout the entire edition, with one or two exceptions, one style of display type—Bookman. It will be noticed that in obtaining the prominence of one line over another, whether in the advertising or in the heading of an article, this has been done through differences in sizes of type and not by the use of other type faces.

Probably nothing like this edition has ever appeared in behalf of any city, and Baltimore may be pardoned in thinking that in not many cities could such a showing be made.

OUR DUTY TO CIVILIZATION.

COMMERCE, without which civilization would end, has been staggered by war. Our responsibility to civilization demands that we give new courage and strength to commerce. As a nation we should not selfishly seek to use the sufferings of Europe as a reason for pushing our own commerce into neutral lands, but Europe is in a war the magnitude of which is beyond human comprehension. It cannot carry on its world commerce, nor can it produce the foodstuffs and the manufactured products which are essential to civilization itself.

It is our duty to the world to meet this situation as quickly as possible, and if out of it there should come, as most certainly there will come, a large increase in our foreign trade to individual and national profit, we cannot be charged with selfishly advancing ourselves at the expense of others.

The duty of the hour demands, not only for our own welfare and the employment of our own people throughout this country, but for the world's welfare, the most vigorous and aggressive effort to meet the world's necessities in trade and commerce.

"QUIT YOU LIKE MEN, BE STRONG."

THIS is like a ringing bugle call to arms. You are not called to the material battlefield on which Europe's armies are contending in the mightiest struggle man has ever known; you are not called to face the bayonet charge or the death-dealing cannons' shot, but you are called to meet every business problem with courage. You are called to be strong and in the routine of every hour's work face with

courage and calmness every business problem, and to be able to "quit you like men."

What a tremendous change would sweep over the South today if every cotton grower, every merchant—indeed, every man—would be strong and self-reliant and quit himself like a man. We cannot have that immediate demand for cotton at good prices which everybody anticipated, but we can be men and face the situation, and with courage win a victory worth more even in material things for the future than would have been a billion dollars for our cotton crop.

Put away pessimism, throw doubts to the winds, and, with a new courage and a new vision of battles to be won, march forward and do your part in bearing the world's burdens created by Europe's war, and your part is to make the best of your individual situation and prove that you can "quit you like men, be strong."

Industrial Activities South.

During August the Construction Department of the MANUFACTURERS RECORD published 4049 brief items relating to new and progressive industrial establishments and betterments, railroad and financial operations, building developments, etc., in the South and Southwest. These have appeared daily in the *Daily Bulletin* and weekly in the MANUFACTURERS RECORD, and, added to the 39,347 items previously detailed for the preceding seven months of this year, make a total of 43,396 items published during eight months of 1914.

The August items are detailed in the following table:

Industrial and Developmental.	
Bridges, Culverts, Viaducts.....	76
Canning and Packing Plants.....	26
Clayworking Plants.....	5
Coal Mines and Coke Ovens.....	24
Concrete and Cement Plants.....	4
Cotton Compresses and Gins.....	43
Cottonseed-oil Mills.....	10
Drainage Systems.....	19
Electric Plants.....	76
Fertilizer Factories.....	17
Flour, Feed and Meal Mills.....	13
Foundry and Machine Plants.....	30
Gas and Oil Enterprises.....	69
Ice and Cold-storage Plants.....	33
Iron and Steel Plants.....	1
Irrigation Systems.....	38
Land Developments.....	38
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Metal-working Plants.....	29
Mining.....	55
Miscellaneous Construction.....	73
Miscellaneous Enterprises.....	149
Miscellaneous Factories.....	51
Motors and Garages.....	5
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Sewer Construction.....	25
Telephone Systems.....	20
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Water-power Developments.....	118
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Woodworking Plants.....	
Buildings.	
Apartment-houses.....	120
Association and Fraternal.....	41
Bank and Office.....	76
Churches.....	78
City and County.....	62
Courthouses.....	18
Dwellings.....	461
Government and State.....	27
Hotels.....	41
Miscellaneous.....	76
Railway Stations, Sheds, etc.....	25
Schools.....	229
Stores.....	204
Theaters.....	27
Warehouses.....	61
Railroad Construction.	
Railways.....	88
Street Railways.....	14
Financial.	
Corporations.....	83
New Securities.....	381
Fire Damage, etc.....	3,474
Machinery, Proposals and Supplies Wanted.....	101
	474
Total for August.....	4,049
Previously detailed since January 1.....	39,347
Total for eight months.....	43,396

Record Year for Southern Mills.

Southern mills consumed, for the first time in any one year, more than 3,000,000 bales of cotton in the season ended August 31, 1914. According to the report of Col. Henry G. Hester, secretary of the New Orleans Cotton Exchange, of the commercial crop of 14,588,501 bales, mills in the cotton-growing States consumed 3,037,308 bales, nearly 200,000 more bales than the number consumed by all the mills of the United States as late as 1897.

Our Chance for Commercial Supremacy in Latin America

By COURTENAY DEKALB.

C[Courtney DeKalb, a mining engineer of distinction, is a native of Virginia, and is now a resident of Tucson, Arizona. He has had practical experience in his profession in South America, Central America and Mexico, as well as in this country, and has had splendid opportunities to study at first hand industrial and commercial conditions in Latin-America. The present situation tempts Mr. DeKalb to become an active representative of firms in the United States seeking to establish trade relations to the south of us, provided satisfactory arrangements can be made with representative houses.—ED. MANUFACTURERS RECORD.]

An interesting result of the European war is the sudden awakening of this country to commercial opportunities in Latin-America. The demand for our goods has already been sharply felt. In so far as ships may be available to carry the cargo, great quantities of American goods will inevitably flow southward. The normal German, British and French sources of supply have temporarily been cut off, and the Latin-Americans are forced to turn to us for the common manufactured necessities of life.

The fact that there exists, in consequence, a great commercial opportunity has been quickly recognized. It remains to be seen whether we will succeed in taking full and permanent advantage of it. If we fill orders without regard to the details of the shipping instructions accompanying them, the customary difficulties which have so long interfered with our developing a South American trade will result. These are custom-house fines, delays for inspection and repacking, damages and loss sustained by such rehandling, and sometimes loss because improper packing has subjected the goods to irremediable injury. If the inveterate American habit of substitution of goods similar to those ordered is not held in check, quantities of commodities, wholly unsalable at the point of final destination, will accumulate in foreign warehouses, to the disgust of the importers. If packing instructions are not rigidly adhered to, enormous losses will occur, either through damage or deterioration en route, or through inability to forward over the last link in the chain of transportation, which may be by mule or by donkey or by llama, with its maximum limit of 100 pounds of cargo.

Unless efforts are made to ascertain the special demands of the people in these countries, the local merchants will cease buying the new-fangled substitutes from the United States as soon as they are able to return to the German, British, French or Belgian shipper, whose products are adapted to the whims of the Latin-American consumer, and whose familiarity with proper methods of packing and invoicing obviate trouble at the custom-house and damage on the way.

We must comprehend that the opportunity now presented is less that of substituting our own normal classes of manufacture than that of substituting ourselves as merchants in the place of the temporarily incapacitated German, Englishman and Frenchman. In order to do this we must learn all the minutiae of this business as thoroughly as the European had learned them; we must follow his methods of solicitation, of extending credits, of invoicing shipments, of special manufacture to fit the local needs of the Latin-American.

We must send men to see him—men who are not so set in their ways that they cannot adapt themselves to the peculiarities of other national prejudices. We must send men to the Spanish-American countries who can fluently and easily converse in Spanish, and others to Brazil who can similarly use the Portuguese. We must send men who are gentlemen, who know how to be courteous, who are deferential to the opinions of others, for it is simply folly to undertake to show a Latin-American the error of his ways and to try to "educate" him to an appreciation of the "Hi-Lo" brand as the one and only, after the manner of a dapper New York drummer hammering new ideas into a Missouri storekeeper. The commercial traveler in Latin-America will meet with delicate courtesy, even in the remote cities of the interior, unless by his own rudeness or inconsiderateness he invites rudeness in return. The person who disdains the Latin races had better stay at home; one must really like the people with whom he does business, or he will not be able to do much. He must also forget his mission as a reformer and go as a humble learner seeking to find what the local merchant can sell, and when

he gets an order follow it up insistently until he sees that the thing wanted is supplied without the deviation of a line from the specifications. It may be a machete of peculiar form; it may be a pot constructed to accord with some feminine notion prevailing in a certain district; it may be a peculiar weave or pattern of cloth; or a shawl of special design worn by some 20,000 women in a certain valley in the Andes—whatever it be, that is the thing they want. That is what the Europeans made in deference to their wishes, and unless we learn these local preferences the people will instantly go back to their former European purveyors, with a deep sigh of satisfaction, as soon as the great war is over.

We can only hold the trade by substituting ourselves as providers of what they want! That is an axiom which must determine our line of action, otherwise we will lose the chance to win the place in commerce with Latin America which would logically seem to belong to us as a birthright.

We had an opportunity 20 years or so ago to obtain this trade and we sacrificed it by our singular indifference to three cardinal points: (1) Proper invoicing in the language of the country of destination in accord with custom-house regulations; (2) proper packing for protection and for convenience in transportation, and (3) proper regard for specifications as to the character of the goods.

Twenty years ago all Latin America was friendly to us. The people were ready to favor us and our commerce, but we so utterly disregarded the points named above that they could not afford to trade with us. The United States and Brazilian Mail Steamship Co. and the Red "D" Line both collapsed, and such little commerce as we had was conducted in foreign ships and by the exporting house of W. R. Grace & Co., which knows how to cater to the Spanish-American and has successfully employed a great fleet of ships in this commerce for many decades.

The present opportunity is unique. We can, if we go at it prudently and carefully, entrench ourselves in the commerce of the Southern republics so that we can never be driven out. The chance will not last long. England is endeavoring to clear the seas of hostile cruisers; it is a supreme test of the efficacy of her navy as an insurance against the destruction of her foreign trade at a time of stress. As soon as the safety of her shipping is assured she will make redoubled efforts to hold fast the rich South American trade and to capture all that she can of what formerly had been enjoyed by her Continental rivals. Hampered by the war, she will not be able to exert her influence so fully but that we may also seize a tremendous advantage. To do so we must promptly send men of suitable equipment to secure orders, establish agencies, advise as to the minute detail which the exporter must follow. The manufacturer at home must employ men competent to carry out these instructions, and he must see that they are attended to with zealous care. It never mollifies the distant importer to be accorded a special discount to offset losses sustained through inattention to his instructions; it does not mend the matter to ship a new lot properly packed or properly manufactured; the merchant meanwhile has lost his profits, and perhaps lost customers who have gone over to more fortunate competitors.

Less than a month ago the store manager of the Motezuma Copper Co. at Nacoari, Mexico, called my attention to the fact that the great majority of their dry goods and hardware came from Great Britain and Europe. It must be noted that this is an American concern, operating its own railroad from Nacoari to Douglas, Ariz.; but free from sentimentality, as business ever is and must be, this company brings foreign goods in bond from Galveston to Douglas, and thence enters

them through the custom-house at Agua Prieta into Mexico. Some of these goods can be bought for less money abroad, but in many cases Americans were ready to meet the European competition so far as price was concerned. The trouble in this instance, which forced a great American mining company to buy abroad, lay in the utter disregard of invoice instructions. The American shipper would not take the trouble. The result would be fines, delays, extra cost for repacking and damage from the handling it received in the custom-house. The invoices made out by the foreign houses, on the contrary, would be in the Spanish language, each article given its correct trade name (which is something

one cannot get out of the dictionary) and all the details as to sizes, weights and the like, stated in the metric system, and arranged in such manner as to facilitate the work of the customs inspector. Firms taking such pains soon acquire a reputation so that their invoices will be accepted by the officials for the purpose of levying the duty without unpacking and personal inspection of the consignment. This is a tremendous advantage which weighs heavily with the importer. He likes to patronize firms which have established a name for accuracy in these important matters.

The prize of Latin-American commerce is awaiting us if we move in the right manner to win it.

American agriculture will get on comfortably and profitably without potash until the European war is over, however long it may last, and that in the meantime our American farmers may be able to determine by practice for themselves whether the theory of our agronomists, that we are spending money uselessly for potash, is grounded in fact.

A simple fact which our agricultural experiment stations have formulated is that, given favorable seasons and cultivation, crop production is limited within narrowest range by the greatest lack in the soil of that element of fertility which the crop demands in the greatest quantity. That lacking element of fertility in most all American soils is found to be phosphorus, derived from phosphate of lime. With all the efforts which agronomists have made to induce our farmers to use this element in increased quantities, they have not been able to persuade them to return to the soil artificially an equivalent of what is annually removed through crop production. It must, therefore, be accepted, conceding to the function of potash in agriculture all that is scientifically claimed for it, that the money annually invested in it by American farmers can at the present be more profitably used in the purchase of increased quantities of soluble phosphates, and that potash should be considered only after soluble phosphates have been returned to the soil in quantity equivalent to what has been removed. What far more vitally concerns American agriculture at the moment than potash is that we should have shipping for our wants of pyrites, that the soluble phosphates may be produced to meet the increased demand which the absence of potash supply will naturally entail, and it is hoped that the Secretary of Agriculture will use the influence of his great office to see that America is supplied with shipping for this commodity from neutral Spain.

The Immediate Consequences to Agriculture of a Non-Supply of Potash

By GEORGE BRADEN, President Federal Chemical Co., Louisville, Ky.

The brokers engaged in the sale of fertilizer material are getting unnecessarily hysterical over the possible consequence of a materially diminished supply of German potash, which will probably be entirely cut off from America until the end of the war in which nearly the whole of Europe is now engaged. The situation is this.

Germany is the sole source of our agricultural supply of potash. The American manufacturers of commercial fertilizers have contracts with the German Kali Syndikat for their potash wants, running over five years from 1911. It is provided that each succeeding year's requirements shall be shipped in equal monthly parts over eight months, beginning in May of each year. It will be seen, therefore, that when the war began in which Germany is at present engaged, only three-eighths of the American requirements for the coming year had been shipped. All chartering of vessels is practically at a stand, and the Kali Syndikat has advised American buyers that no more shipments can be made until present war conditions are materially changed.

It will be difficult for our perturbed brokers to impart their excitement over potash either to the dealer in fertilizers or to the farmer who uses them, for the very obvious reason that a large number of the most intelligent farmers in the East and the middle West have long used fertilizers, and are continuing to use them, in which the element potash is entirely absent. They claim that soil tilled by greater depth of plowing contains a sufficient supply of this element for many years hence, and that at the present money is needlessly spent in America therefor. In this they are substantially supported by leading American agronomists who have given serious study and efficient field service to the subject. It is further substantiated by the fact that the most profitable yields of wheat, followed by clover, that were ever produced in America before the general introduction of soluble phosphates were grown with ground bone carrying about 4 per cent. of nitrogen, 22 per cent. of phosphoric acid and no potash, which formerly sold as low as \$24 per ton, and this product, were it to be had at this price now, could be still sold for fall seeding in practically unlimited quantities. The ground bone was not used for grain planted in the spring, because it was assumed that it was not readily enough soluble for spring crops; so that the grain crops of spring planting were not fertilized until the general introduction of the soluble phosphates. It was some time after the advantages of the soluble phosphates were demonstrated for spring crops before they were used for wheat; but as the demand for bone increased for use in the general arts, the price advanced so materially that soluble phosphates were substituted for it in wheat fertilization, and their use has steadily increased. For many years after the introduction and successful use of the soluble phosphates they were compounded with nitrogen alone in the form of animal tankage from the packing industry, nitrate of soda and sulphate of ammonia, while potash was of no consideration. When the German potash producers put their product upon the American market they established a rich propaganda to exploit its advantages, and in time

it came to be quite extensively used. Whether our agronomists are correct in their theory that we are at present uselessly spending millions of dollars annually for German potash I am not ready to say; but what is well attested is that in instances without limit our farmers are using for grain fertilizer formulas high in the soluble phosphates and well balanced in nitrogen, in which the percentage of the element potash is so insignificant as to count for absolutely nothing in crop production, and that these formulas are producing 30 to 40 bushels of wheat per acre proportionately as the soil requirements are met by the quantity applied. From this experience I think we may be assured that

Sulphuric Acid Industry Not Affected by War

"The war will not injuriously affect the sulphuric acid business in America in even the slightest degree." So declared Mr. C. Wilbur Miller, president of the Davison Chemical Co., one of the largest sulphuric acid makers in the world, in response to an inquiry by the MANUFACTURERS RECORD.

In view of the fact that about three-fourths of the pyrites from which sulphuric acid is obtained in this country comes from abroad, a suggestion has been made that perhaps it would be necessary to secure sulphuric acid from the large sulphur deposits of Louisiana and Texas or to greatly increase the pyrites ore output of this country.

Mr. Miller states, however, that not only is there no likelihood of there being any shortage in the foreign supply of pyrites on account of the war, but also that the sulphuric acid manufacturers of this country are not likely to ever turn from pyrites to sulphur as a source of supply.

"The facts," said Mr. Miller, "are that pyrites supplanted brimstone in the manufacture of sulphuric acid, and it would cost millions of dollars to discard the machinery now installed and equip plants for the brimstone process. Moreover, the sulphur people could not afford to cut into the business anyhow. Their product fetches a price of around \$22 a ton, and they could not touch the sulphuric acid business for anything above \$7 a ton, and I doubt if they could capture it at that. The copper and metals in pyrites make it valuable to mine without reference to the sulphuric acid, and, as a matter of fact, the owners of pyrites mines could give away the sulphuric acid if it came to a competition with the brimstone people.

"As there is no way of telling how much sulphur there is underground in either the Louisiana or Texas fields, it would be an unwise move for the acid manufacturers to change their equipment even were the price to be attractive. Should there be a greater production of sulphur from the Louisiana and Texas mines than the market would readily absorb at any one time, it would be very much more to the advantage of the mine owners to allow the sulphur to accumulate

in the yards. They could afford to store up 500,000 or 600,000 tons rather than to attempt to compete with pyrites by reducing the price.

"Furthermore, the present uses of sulphur are increasing so much, notably in the manufacture of paper, that the sulphur mine owners have no inducement to attempt to enter the sulphuric acid field.

"Imported pyrites are almost exclusively obtained from Spain, and the manufacturers of sulphuric acid in this country are generally interested in the pyrites mines. We, ourselves, entirely own our source of supply. There is no likelihood of any interruption in shipments, as there are more than 200 ships in the service, and even in the event that a few of them were to be sunk it would not seriously interfere with our supplies. As a matter of fact, there are more pyrites available now than if the war was not on. The plants in Germany and France are practically shut-down, and we have been offered shiploads of pyrites by independent owners whose markets have been cut off. We have more pyrites on hand now than we can conveniently find storage room for, and have found it necessary to restrict shipments rather than take thought of any practically impossible famine in supplies."

In this connection it is of interest to note the production of sulphur in this country for some years past, and also the production and importation of pyrites, as furnished by census returns.

The output of pyrites from American mines and the amount imported annually for the last six years have been as follows:

Year.	American. Tons.	Imported. Tons.
1908.....	222,598	668,117
1909.....	247,070	688,843
1910.....	241,612	803,551
1911.....	301,458	1,006,310
1912.....	350,928	970,785
1913.....	341,338	850,582
Total.....	1,705,004	4,988,198

These figures show a larger percentage of increase in the output of American pyrites mines between 1908 and 1913 than the increase during the same period in the importations of foreign pyrites. The percentage of local ores to the total is now larger than in 1908, the

increase in 1913 having been nearly 120,000 tons over 1908. The highest point reached in the importation of foreign pyrites during this period was in 1911, with a total of over 1,000,000 tons. From these figures there was a small decrease in 1912 and a larger increase in 1913.

Nearly half of the output of American pyrites is from the South, Virginia producing 148,259 tons in 1913 and Georgia 11,110. Other considerable deposits of pyrites ores have been reported in various parts of the South, and further investigations ought to be made as to the feasibility of developing on a large scale the deposits of our own pyrites to lessen our dependence upon Spain.

The marketed production of sulphur by years has been as follows:

Year.	Tons.
1908.....	369,444
1909.....	239,312
1910.....	255,534
1911.....	265,664
1912.....	303,472
1913.....	311,590
Total.....	1,745,016

The marketed production is not always the actual amount produced. Louisiana produced in 1912, for instance, 786,605 tons, although only 303,472 tons of the country's output was marketed.

The development of large sulphur deposits at Freeport, Tex., by leading capitalists of New York and other cities promises to very largely increase the output of American sulphur. The South is already producing about three-fourths of the world's sulphur supply, and dominates the sulphur markets of the world.

In 1913 this country made 3,538,980 tons of sulphuric acid. About 16,000 tons of sulphur only were used in making acid. Of the total quantity produced, 790,296 tons were the result of by-product operations in smelting copper and zinc; the balance, 2,748,684 tons, were practically all derived from pyrites.

The South is not only a very large producer of pyrites ores and practically the chief producer of sulphur in this country, but it is also the chief producer of sulphuric acid. The large plant at Baltimore using foreign ores and the plant in Tennessee making sulphuric acid as a by-product of copper smelting and the many plants in other parts of the South operating in connection with fertilizer plants largely concentrate this business in the South.

The leading uses of sulphuric acid are in the manufacture of fertilizers, in the refining of petroleum, in the iron, steel and coke industries and in the manufacture of nitrocellulose, nitroglycerin, celluloid, etc., and in general metallurgical and chemical practice.

A \$500,000 Reinforced Concrete Bridge.

Final plans and specifications have been adopted for the bridge which the Tennessee River Bridge Commission of Hamilton county, Theo. F. King, chairman, Chattanooga, Tenn., has been planning to build across the Tennessee River to connect Chattanooga with Hill City, a large and growing suburb. The appropriation amounts to \$500,000, and bids for construction will probably be invited in September. This bridge will have a total length, including the approach, of about 2450 feet, about 2100 feet of this being concrete construction and the remainder being an earth fill. It will be 50 feet wide. Over the Tennessee River the bridge deck will be carried on six concrete arches, four of which will have a clear span of 180 feet and two will have a clear span of 165 feet. Directly over the channel there will be a steel lift span of 300 feet clear, all other concrete work consisting of either beam and girder construction or retaining walls with earth fill. See accompanying illustration of the bridge as it will appear when com-

pleted. B. H. Davis, 17 Battery Place, New York, is the engineer, and plans can be seen at his offices.

OUTLOOK FOR SUGAR.

Congressman Broussard on the Situation in Louisiana.

Congressman R. F. Broussard of Louisiana writes from Washington, D. C., to the MANUFACTURERS RECORD:

"I am just back from a trip to the sugar district of Louisiana, and my secretary called to my attention your letter of the 12th of August, together with his reply thereto. I feel that I am in a better position to answer your letter after a personal study of the present sugar situation in Louisiana at close range.

"The European war has sent the price of sugar up at a remarkable pace. As a result, confidence has been reinstated, for the time being, in the sugar district. Credit has opened up; the crops are promising; weather ideal, and doubtless much money will be obtained for the growing crop.

"The situation was so precarious that, despite the good prices prevailing, few of the planters and cane-growers will come out with much money, although most of them should come out without debt.

"The general opinion is that the prevailing prices will hold for the next crop, and it is probable that there will be a large crop produced next year. Of course, it is probably that the war in Europe will have been settled and normal conditions in France, Germany and Austria will probably be re-established, so that the world's supply of sugar will be nearer meeting the demand by the time the free sugar schedule of the Underwood bill becomes effective. I look to a similar depression in prices following free sugar as we have had this year, and unless Congress should promptly give assurances that the free-sugar policy of the present administration will not become effective in 1916, it is probable that that industry will languish and the people engaged in it retire from the business.

"I am frank to say that I do not at present see any indication justifying the belief that the present administration will recede from its policy of making sugar free in 1916."

The Birmingham Iron Market.

[Special Correspondence Manufacturers Record.]

Birmingham, Ala., August 29.

The pig-iron market for the month of August has been very active, and at least 300,000 tons of iron at \$10.50 and upwards has been sold by the different interests in the district. This tonnage has moved since the war in Europe commenced, and many furnace men are of the opinion that war conditions will have little effect on the Birmingham district. It has been stated that the heavy buying movement has been the desire of the foundry and other interests to secure iron so they would be prepared for any emergency that might arise by reason of the European conflict.

The buying has not been with any one concern, but all of the big interests have sold practically the same quantity, for delivery between the first of September and the first of January. The price has stiffened perceptibly during the month, and the indications are that there will be little No. 2 furnace iron sold in the district for less than \$10.50, with the indications pointing to \$11.

Many of the sales were made to pipe plants that are buying heavily at this time and laying in a stock that will last them for several months. One iron interest has booked within the month 100,000 tons of iron, far

in excess of its make, while all of the interests have sold beyond their make, but have the stock on the yards to draw from that will make it an easy matter to supply all demands.

In connection with the iron market in Birmingham and the coal situation here, it has developed during the week that South American brokers have requested local iron brokers to let them know what could be done in the way of pig-iron shipments to South America. Local men have been investigating the South American trade as to iron for some months, but nothing definite has been done. One interest has been asked as to the supply, but as the South American buyers are accustomed to buy iron on 60 days to six months time the Birmingham interests are not in a position to handle the business, especially at this time of the year, when the banks are making every effort to handle the cotton crop.

There is little probability of any move in the line of selling to the South American trade until there is a way to get the financiers to establish branches in South America to handle discounts. It is also held that there are no financial houses in South America from which reports could be had as to the credit of the people wanting to make purchases.

It has been reported during the week that the United States Steel Corporation would furnish some steamers to build up the South American trade, and the matter has caused a great deal of interest among local dealers. While this matter has been current talk, there is nothing definite as to any action having been taken.

The Alabama Company will blow in No. 2 furnace at Ironaton in a few days, and it is reported that the Tennessee Coal, Iron & Railroad Co. will in a short time place another furnace in blast at Bessemer. The furnace at Bessemer fired a week ago to make manganese iron will make its first cast on September 1.

The United States Cast Iron Pipe & Foundry Co. shipped a trainload of iron pipe during the week, filling the order booked some weeks ago for the Panama Canal. The shipment was of 36-inch pipe, and went to the port of New Orleans for shipment by steamer.

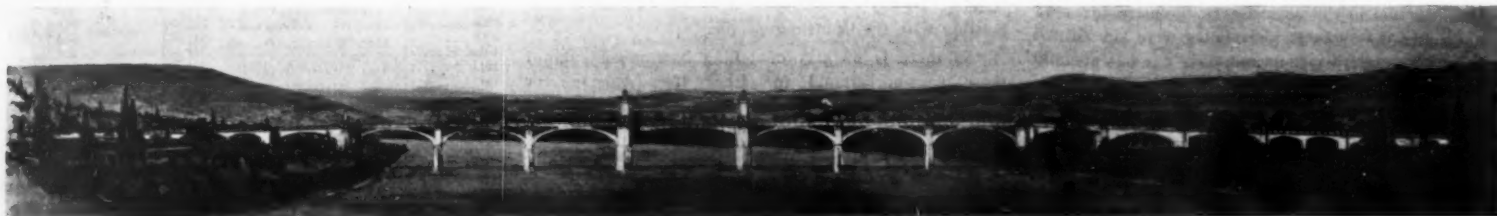
It is reported on reliable authority that extensive improvements will be made at the Bessemer rolling mill of the Tennessee Coal, Iron & Railroad Co., adding largely to the capacity and making the plant a modern one in every respect. The old material market shows no strengthening, the prices and demands continuing about as reported for the past few weeks.

There is an increased tonnage in quantity of coal mined, and coal interests are looking for a good business during the rest of the year. Some large sales have been made, and at all of the mines there is renewed activity. Some mines that have been idle are going into operation and will be worked to their fullest capacity.

The Chamber of Commerce in Birmingham will appoint a strong committee to attend the meeting of the Alabama Railroad Commission on September 14 for the purpose of vigorously fighting the proposed increase in freight rates from Birmingham to Alabama points. Some weeks ago the railroads asked the Railroad Commission to increase the rates on coal from Birmingham to certain Alabama points 10 cents a ton, and it is to protest against this move that the committee will meet with the Railroad Commission in Montgomery.

A Birmingham Blueprint Company.

The Tredinnick-Duncan Blueprint Co., Birmingham, Ala., has been incorporated and organized with the following officers: N. W. Tredinnick, president; J. Harold Duncan, secretary. It has installed a blueprint machine with a daily capacity of 35,000 feet and is preparing to install a tracing reproduction process for making tracing valuation sheets as prescribed by the Interstate Commerce Commission.



A \$500,000 REINFORCED CONCRETE BRIDGE, TOTAL LENGTH 2450 FEET, TO CONNECT CHATTANOOGA AND HILL CITY, TENN.

Southern Railway's Coal Docks at Charleston

CONTRACT AWARDED FOR FACILITIES THAT WILL INCREASE THE IMPORTANCE OF THAT PORT.

In accordance with the policy previously announced, Southern Railway Co. has awarded contract for the construction of modern coal dock facilities at Charleston, S. C., which will enable the Virginia & Southwestern Railway Co. and Southern Railway Co. to handle coal from the coal fields of the South through the port of Charleston.

A large amount of material for the dock has been purchased, and the actual construction of the work will be begun in about two weeks. It is expected that it will take the machinery manufacturers about six months to complete their work, and therefore the plant should be in operation in the early part of next spring.

The dock will be constructed on property which has been acquired on the Cooper River, north of Belvidere Creek, containing about 120 acres, with more than 4000 feet of river front, having a depth of water adequate for all requirements. The physical plans adopted are the result of careful investigation and experiment on this property by competent engineers who have specialized in such problems, and the management is going ahead with the physical construction on the basis of their reports.

The contract has been awarded to the Wellman-Seaver-Morgan Company of Cleveland, O., for the construction of the coal-handling machinery. The proposed terminal will be equipped with the latest coal appliances, so vessels can be loaded with maximum speed.

With a view to determining the best equipment for reliability, for careful handling to reduce breakage, and for rapidity of loading, Southern Railway Co. has had made exhaustive studies of methods of handling coal, and has finally adopted a design for the plant which it is believed will be more than adequate in every way. This plant is designed with a capacity to deliver coal to vessels at the rate of not less than 2000 tons per hour in the best possible condition. The facilities will be of sufficient capacity to load vessels of the largest type. A single unit will now be constructed, but the plans have been so arranged that as the business develops the facilities can be enlarged so as to meet the needs of the additional traffic. There will be a movable loading tower, which will travel the full length of the dock, and a movable car dumper, which will travel 300 feet. This dumper will be designed for dumping coal from all types of open-top railway cars into a receiving hopper on the coal-loading tower. The car dumper will be mounted on wheels designed to travel along the runway, this runway being elevated above the dock on a special trestle system. Intermediate, between the runways of the car dumper, will be a standard-gauge railroad track over 5000 feet in length for bringing cars to the plant, and ample yard tracks are also provided which will facilitate the rapid handling of the loaded and empty cars. The car dumper proper travels over this standard-gauge track, and is provided at each end with movable approaches, up which the loaded cars will be pushed by means of an electrically-operated car pusher. After the dumper has been properly placed opposite the loading tower, the incoming loaded car is placed on the cradle in the position for dumping. In the first motion of rotation of the cradle the car will move on a rolling platen sideways until its side rests securely against the side of the cradle. The cradle will then be rotated until the car has been inverted to an angle of 70 degrees with the horizontal. During the rotation of the cradle the clamp beams automatically clamp the car securely in its position by means of heavy counterweights which travel in guides at the rear of the structural framework. This arrangement of car clamps is a distinctive feature, and their action is entirely automatic, depending simply on a counterweight system for their operation. The clamps will not injure either steel or wooden cars, and will release automatically as the car is lowered to its original position. After the car has been dumped another loaded car is brought up the incline approach, this car replacing the empty car and pushing it out of the cradle,

when it will run down the discharge on the empty car storage track. The operation is then repeated.

The coal-loading tower will consist of a structural-steel framework, supporting a folding boom, extending over the boat and terminating in a telescopic chute so designed as to be lowered through the hatch for discharging the coal into the cargo hold. The lower end of the chute will be provided with a rotating trimmer of the Blake type, and a gate will also be provided to regulate or stop the flow of coal.

The boom will be so arranged that it may be retracted when loading boats of small beam, or it may be fully extended to give a maximum reach. The boom and the chute are arranged so that they may be folded up in order to clear the rigging of ships.

At the rear side of the tower will be a tilting hopper, which will be designed to receive coal from the movable car dumper, which travels on an elevated runway at the rear of the loading tower. This hopper will be hinged at the forward side in a position directly over the boom, and the hopper will be actuated by means of ropes. This hopper will be of sufficient capacity so that when lowered to a horizontal position a carload of coal can be dumped into it; then by elevating the rear end of the hopper this coal may be dumped onto a flight conveyor, which is carried on the boom and transfers coal through a telescopic chute into the cargo hold.

TEXAS' MINERAL OUTPUT.

Increase in Value of Annual Production in the State in 1913 to More Than \$30,000,000.

Texas, the largest of all the States in area and fifth in the number of inhabitants, ranks nineteenth in the value of its mineral production, according to the United States Geological Survey. In each of the last two years Texas advanced two numbers in the rank of mineral-producing States, from twenty-third in 1911 to twenty-first in 1912 and to nineteenth in 1913. In the percentage of its increase in 1913 over 1912 Texas was exceeded by only one other State—its northern neighbor, Oklahoma—which, on account of the sharp advance in the price of petroleum, showed a gain in value of mineral products of nearly 50 per cent., while Texas showed an increase in value of 38.9 per cent.—from \$22,797,915 in 1912 to \$31,696,910 in 1913. In Oklahoma the increase in 1913 was due to the advance in the price of one substance; in Texas increases were made in the output of all the products which contributed materially to the total value, but especially, as in Oklahoma, in the production of petroleum. Texas does not hold first place as the producer of any mineral substance, but ranks second in the production of asphalt and third in the production of quicksilver. Since the sensational strike at Beaumont in 1901, petroleum has had first place in the mineral products of the State, and Texas now ranks fourth among all the States in the quantity of petroleum produced, and seventh with respect to the value of the product. The value of the petroleum product in Texas in 1913 represented a little more than 45 per cent. of the total for the State. The production increased from 11,735,057 barrels, valued at \$8,852,713, in 1912, to 15,090,478 barrels, valued at \$14,675,593, in 1913. The increase in production came almost entirely from the Electra field, in the northern part of the State, where a large amount of development and wildcatting has been carried on for the last two years. The production from the coastal fields decreased from 6,459,528 barrels in 1912 to 5,825,226 barrels in 1913, but the value increased from \$4,739,887 to \$5,550,408. In the northern fields the production increased from 5,275,529 barrels in 1912 to 9,184,252 barrels in 1913, with an increase in value from \$4,112,826 to \$9,125,185. The Electra field alone increased nearly 4,000,000 barrels, from 4,227,104 barrels in 1912 to 8,134,024 barrels in 1913, with an increase in value of over \$4,800,000, from \$3,340,828 to \$8,142,797. The average value per barrel

for Electra oil advanced from 79 cents in 1912 to \$1 in 1913. There was also considerable development in the Henrietta field, but the output there was relatively insignificant compared with the output of the Electra field. The possibilities for oil development are more widely scattered over Texas, and the indications for wildcatting are more promising than in any other State. The chances for further extension are therefore excellent.

Second in importance among the mineral products of Texas, reckoned by the value of output, is coal, including lignite or brown coal, the combined production of which amounted in 1913 to 2,429,144 short tons, valued at \$4,288,920, against 2,188,612 short tons, valued at \$3,655,744, in 1912. Texas is the only State in the Union that produces considerable quantities of both bituminous coal and true lignite, or brown coal. The areas of bituminous coal are much less in extent than those of lignite. The production of bituminous coal represents more than half of the total output in quantity and about 75 per cent. of the total value. In 1913 the bituminous coal mined in Eastland, Erath, Maverick, Palo Pinto, Webb, Wise and Young counties amounted to 1,197,207 short tons, valued at \$3,184,161. The production of lignite amounted to 1,181,156 short tons, valued at \$1,104,759. Lignite-mining operations have been carried on in Anderson, Bastrop, Fayette, Henderson, Hopkins, Houston, Lee, Leon, Medina, Milam, Rains, Robertson, Shelby, Titus, Van Zandt and Wood counties. The lignite areas extend in a belt from the Sabine to the Rio Grande, and the production is limited at present to 11 of the above-named counties, among which the principal ones are Milam and Wood. The total area that is believed to be underlain by lignite is about 55,000 square miles, of which the developed areas cover about 2000 square miles. The known bituminous areas cover about 8200 square miles, but 5300 square miles more about which little is known may contain coal. The bituminous areas are somewhat scattered, the larger fields being in the central part of the State and two smaller areas bordering on the Rio Grande.

The only other mineral products of Texas which contribute as much as \$1,000,000 to the total value are asphalt, cement, clay and natural gas. The clayworking industry in 1913 contributed wares valued at \$3,049,349, compared with \$2,886,068 in 1912. The principal clay products are common brick, sewer pipe, front brick, pottery and vitrified brick, the common brick constituting in 1913 about 60 per cent. of the total. The chief clayworking counties are Ellis, Wilson, Bastrop and Bowie. An interesting incident of fire-brick manufacture in Texas is that in Brewster county clay is used in a yard 130 miles from the railroad for making brick used in the quicksilver furnaces of the Terlingua district. Kaolin, from which excellent china and porcelain wares have been made, occurs and has been mined in Edwards county. Extensive deposits of fuller's earth have been found in Burleson, Fayette, Smith and Washington counties, and some was produced in Fayette county in 1912, but none in 1913.

The manufacture of Portland cement in Texas is an industry barely five years old at the end of 1913. The construction of the plants was begun in 1907, and in 1908 the total production of the State was 500,000 barrels; in 1911 it exceeded 1,500,000 barrels; in 1912 it exceeded 1,750,000 barrels, and in 1913 it amounted to 2,108,737 barrels. The value of the cement produced in Texas in 1913 was \$2,663,063, an increase of over \$600,000, from \$2,062,124 in 1912. Raw materials for the manufacture of cement are abundantly distributed throughout the State. The present operations are confined to four plants, two near Dallas and one each at San Antonio and El Paso.

The value of the natural gas produced also showed a substantial increase, amounting to \$2,073,823 in 1913, against \$1,405,077 in 1912.

The asphalt produced in Texas, which is principally residue obtained from the heavy asphaltic oils, amounted to 122,026 short tons in 1913, valued at \$1,970,354, against 88,097 short tons, valued at \$1,384,640, in 1912. In addition to this, a small quantity of natural asphalt was produced.

The only products of any importance which did not show an increase in value in 1913 over 1912 were gypsum and salt. In gypsum there was an increase in the quantity of the crude material mined, from 160,863 short tons in 1912 to 161,000 tons in 1913; but the value of the output, most of which was sold as calcined plaster, decreased from \$356,579 to \$345,749. The prin-

cial gypsum operations are at Acme, in Hardeman county, and at Hamlin, in Fisher county. The production of salt decreased from 373,064 barrels, valued at \$290,328, to 355,529 barrels, valued at \$278,098. The decrease in the salt production was due to the destruction by fire of one of the salt-making establishments at Colorado.

The principal quarry product is limestone, which is produced in Bell, Bexar, Comal, Coryell, El Paso, Erath, Grayson, Guadalupe, Jack, Jones, Kaufman, McCulloch, Nonan, Palo Pinto, Stephens, Travis and Williamson counties and is used for building, for foundations, for curbing and flagstones, for road-making, for concrete and for flux. Granite is produced in Burnet, El Paso and Llano counties. The red granite of Burnet county has few equals in attractiveness in this country. The total value of the stone produced in Texas in 1913 was \$725,106, against \$680,365 in 1912, and about 80 per cent. of the total value was in the output of limestone.

Other mineral products of the State are copper, gems, a small amount of gold, iron ore, lead, lime, mineral waters, quicksilver, sand and gravel, sand-lime brick, silver, sulphur and zinc. Sulphur operations, with methods similar to those employed at Sulphur City, La., were begun at Bryan Heights, in Brazoria county, in 1913.

A Solution of the Cotton Problem?

A sidelight upon the cotton situation in the South is thrown by a letter to the MANUFACTURERS RECORD from a Georgian who is interested in a warehouse and has other business relations with cotton-growers. He writes:

"I operate a cotton warehouse with 25,000 square feet of floor space; the floor is concrete. In this connection I sell farm implements and livestock, which are sold to the farmers on long terms of payment, dependent solely on the cotton crop for funds with which to pay this indebtedness. It is costing the farmer 8½ to 10 cents per pound to make this cotton. He has to sacrifice this commodity at the prevailing price now of 8½ cents. He cannot pay living expenses, much less pay me for the merchandise I have sold him. The average market for the past several years for this cotton has been 12½ cents. To come in and foreclose my notes and mortgages against the farmer, forcing him to pay me, would be doing us both a great injustice at a time like this; but, since I am bonding my warehouse, if a plan could be devised whereby \$50,000 or \$100,000 worth of cotton could be accepted from these debtors, allowing them some 8 or 9 cents per pound at the time of depositing their cotton and holding the same until after a settlement of this European trouble, it would have two results. It would enable me to make such collections that I could pay my indebtedness and after the reaction allow the farmers some 3 or 4 cents per pound because of enhancement in market values by that time. They owe me; I owe somebody else. If I can establish a connection to accommodate them to about two-thirds of the average price of cotton that has prevailed for the past four years, which has been 12½ cents, they will be satisfied and it will enable me to meet my obligations as well."

The way to the solution of the problem here presented is through the warehouse system which was successfully operated in Birmingham in the period of financial depression of 1907 and 1908, as indicated in the MANUFACTURERS RECORD of August 27, in which was reproduced a copy of a warehouse receipt supplied by Mr. W. P. G. Harding of the Federal Reserve Board. Receipts of the kind were issued by a warehouse with a good financial backing, on a basis of \$35 for each bale of cotton warehoused. For each bale three receipts of \$10 each and one of \$5 were issued. These receipts were accepted by leading banks at their face value and by business houses in Birmingham in payment of obligations. When the cotton was finally sold the holders of the receipts received the cash value of them and the balance of money received for the cotton was paid to the growers who had warehoused it.

The Georgian has thought out just that system. The only step that now remains to be taken is to obtain assurance from financial institutions of his community or neighborhood that they will accept receipts similar to those that worked so satisfactorily at Birmingham.



GEER BUILDING, DURHAM, N. C.

The Geer Building, Durham.

The Fred C. Geer Company has awarded contract for what will be one of the largest buildings in Durham, N. C. This structure will be located at Main and Corcoran streets, and will be 150x98 feet, of fireproof construction, costing about \$200,000. On the first floor will be two large stores, extending from Main street to Parish street, a store on Corcoran street and one on Parish. Above the first floor space will be provided for 90 offices, while the corner room of the first floor will be occupied by the Fidelity Bank. Waterproof basements will be constructed under the entire building and provision made for natural light by installing vault lights. Plans and specifications for the building were prepared by Alfred C. Bosson of New York and general contract was awarded to the Wells Bros. Co. of New York, with offices in Washington.

Ford Motor Co. at Atlanta.

Owing to the rapidly-increasing demand for Ford automobiles in the territory tributary to Atlanta, the Ford Motor Co. of Detroit has decided upon the construction of a large branch service plant in that Georgia city. The plant building (see accompanying illustration) will be of reinforced concrete, 300x142 feet, four stories high, costing about \$275,000. Irwin & Leighton of Philadelphia have received the contract to erect the building, the plans and specifications having been prepared by John Graham of Detroit, supervising architect of the Ford Motor Co. This building will be completely equipped for storing Ford motor-car parts and assembling Ford automobiles for service.



FORD MOTOR CO.'S \$275,000 ATLANTA SERVICE BUILDING.

Argentina Wants American Products.

Bernardino Iracheta, General Paz, Buenos Aires, Argentina, writes to the MANUFACTURERS RECORD as follows:

"I take the liberty of handing you a list of the articles that we would like to get here and that we can handle. The articles are: Two iron double beds; 2 iron beds for 1½; 2 iron beds for 1; 1 dozen regular Vienna chairs; 5 dozen imitation Vienna chairs; 2 cases syringes for ordinary use; 2 hominy machines; 1 machine for crushing corn for poultry; 2 automobiles; equipment for laundry purposes; 7 pieces of goods like the sample we send you in separate enclosure; 500 kilos (2 pounds) of thread like the sample; 50 kilos of thread a little thicker than the sample; 25 kilos of thread more delicate; 200 dozen soles for shoes (Alfargata). Business can be done with us easily through the Spanish Bank of Rio de la Plata and also through the London Bank of Rio de la Plata. The usual documents and shipping papers can be sent on with the goods, and we would acknowledge them and pay for them before the goods are delivered. The financial agents of these banks would attend to all the business and see that the payments are properly made."

The annual convention of the Southern Appalachian Good Roads Association will be held at Bristol, Va.-Tenn., October 6-9.

The city limits of Macon, Ga., have been so extended as to embrace about 14 additional acres of land and 5000 more population.

MINERAL OUTPUT OF 1913.

United States Breaks Its Record With a \$2,500,000,000 Production.

"The year 1913 was our banner year in the production of minerals" is the announcement made by Secretary of the Interior Lane. This statement was based upon figures presented to him by the Geological Survey. The Secretary further said:

"Our mineral production in 1913 reached the unequaled amount of \$2,500,000,000, which was an increase of more than \$200,000,000 over the output for 1912, and of \$500,000,000 over the 1911 figures. All who are in touch with the mineral industry expect still further increase in future years by reason of the new opportunities for marketing mineral products on account of the European war and the opening of the Panama Canal. Already a beginning has been made in the exploitation of domestic sources of minerals which hitherto had been largely imported into this country or for which there had been no foreign markets open to the United States.

"Of even greater benefit to American industry than the large export of crude minerals will be the development of manufactures dependent upon these mineral products as raw materials."

Iron-Ore Output in 1913.

According to statistics recently completed by Ernest F. Burchard of the United States Geological Survey, the production and shipments of iron ore in the United States exceeded those of any previous year. The crude iron ore mined in the United States in 1913 amounted to 61,980,437 long tons, compared with 55,150,147 tons mined in 1912, an increase of 6,830,290 tons, or 12.38 per cent. The iron ore shipped from the mines in the United States in 1913 amounted to 59,643,098 long tons, valued at \$130,905,558, compared with 57,017,614 long tons, valued at \$107,050,153, marketed in 1912, an increase in quantity of 2,625,484 long tons, or 4.60 per cent., and in value of \$23,855,405, or 22.28 per cent. The average price of ore per ton for the whole country in 1913 was \$2.19, compared with \$1.88 in 1912. These quantities of ore, both mined and marketed, include the iron ore used for fluxing other metallic ores at smelters in the Middle and Western States, but do not include the iron ore sold for the manufacture of paint. The iron ore marketed for paint in 1913 amounted to 16,950 long tons, valued at \$44,851. The ore reported as sold for fluxing purposes other than in the manufacture of pig-iron amounted to 62,842 long tons, valued at \$235,588, in 1913, compared with 88,449 long tons, valued at \$244,315, in 1912. The domestic iron ore actually marketed for the manufacture of pig-iron amounted in 1913 to 59,580,256 long tons, valued at \$130,669,970, compared with 56,929,165 long tons, valued at \$106,805,838, in 1912.

Iron ore was mined in 28 States in 1913, one more than in 1912. Idaho, Montana and Nevada produced ores for fluxing only; part of Colorado's output was used for fluxing and part for pig-iron; a little magnetic ore mined in Utah was shipped to a Salt Lake iron foundry for testing a new method of reduction, and the remainder of the Utah ore was used for fluxing. The other States produced iron ore for blast-furnace use only, except small quantities for paint from Georgia, Michigan, New York and Wisconsin, which are, however, excluded from the above figures for iron ore.

The rank of the five States producing the largest quantity of iron ore—Minnesota, Michigan, Alabama, New York and Wisconsin—remained unchanged in 1913, but there were a few changes in the relative rank of certain of the smaller producers.

St. Louis Screw Co. Enlarging.

Having decided details for its proposed enlargements, the St. Louis (Mo.) Screw Co. has begun construction on its 11½-acre site at 6900 Broadway, extending to terminal tracks. The company's plans may be briefly summarized as follows: Steel-construction buildings 396x80 feet, 216x140 feet and 210x80 feet, respectively, with 106x34-foot coal pulverizer and 40x30-foot transformer buildings, all arranged for future additions.

Following construction of mill buildings will erect bolt and nut plant, screw plant, general warehouse and office buildings; obtain electric power from Union Electric Light & Power Co.; receive electricity at 13,200 volts and transform, as required, to 2200, 440 and 220 volts; operate 600 horse-power mill motors at 2200 and smaller motors at 440 volts; motor-generator set for direct current; equipment to include coal crushing and pulverizing plant of eight tons capacity hourly and complete system cranes and monorail hoists; concentrate entire plant at new location upon sale or lease of present plant; manufactures screws, bolts, etc.; will add manufacture of bar iron and steel.

Destructive Distillation of Yellow Pine.

For many years more or less successful efforts have been made at various points in the South to extract turpentine and other oil and tar products from the stumps and forest refuse of the long-leaf pine. A recent installation of a plant for the destructive distillation of resinous pine wood has been made by the National Wood Products Co. of Wilmington, N. C., after a series of experiments covering a period of eight years, in which co-operation was given by the bureau of chemistry, United States Department of Agriculture. The principal feature of this process, which is believed to have been worked out on a commercially successful basis, is the control of the heat, by which it is said to be possible to produce perfectly pure white turpentine by a simple refining process of the distilled spirits. The heat control is secured by means of a circulating bath of mineral oil heated in a coil in an ordinary furnace and forced through spiral coils which line the interior of the retorts. For distillation purposes the oil is kept at a temperature just sufficient to distill off the turpentine, after which the temperature is raised and the tar oils and creosotes are distilled over, and the wood is reduced to pure charcoal. At the completion of the process pitch is drawn from the bottom of the retorts.

The plant is equipped with two retorts, each 90 feet in length by five feet in diameter. The wood is placed in small cars in cordwood length, and a train of nine cars run into each retort. The entire process of distillation is completed in less than 24 hours, including the drawing of the charcoal and reloading of the retorts.

The products from a cord of resinous pine wood are said to be approximately as follows: Refined turpentine, 15 to 25 gallons; pine oil, 2 to 5 gallons; tar oils and creosotes, 60 to 90 gallons; pitch, 100 to 200 pounds; charcoal, 1000 pounds. In addition, a large quantity of pyroligneous acid (about 75 gallons per cord) is obtained and from 6000 to 10,000 cubic feet of illuminating gas, the latter being burned in the furnaces.

New England Cotton Mill Men.

At the September meeting at Lenox, Mass., of the National Association of Cotton Manufacturers, the program will include papers on beam dyeing, commerce in cotton goods with South America, cost of the permanent fireproofing of cotton goods, effect of structure on the strength and wearing qualities of fabrics, health of the employe, Lever cotton law, pink boll-worm in Egyptian cotton, production and preparation of raw cotton for the spinner, time temperature distributions in a bale of cotton, trade-marks in cotton textiles, visits to cotton mills in the Far East, weft yarn inspection, world's demand for cotton and India's part in meeting it.

Chemicals, Building Materials, Etc.

B. Madert, Ave du College, pres du College Francais, Tangier, Morocco, Africa, writes to the MANUFACTURERS RECORD:

"The name of your estimated paper was handed to me by the General Consul of the United States America at ours, and I have much pleasure announcing to you that I have opened an agency of import and export at Tangier. I am interested in all kinds of chemical products concerning construction of buildings, of industries, etc.; machines of all kinds. Please give my name to the manufacturers and shipping companies of your country desirous to enter in relation with our country.

Kindly let me know what shipping companies will touch our port."

To Market Virginia Apples.

Apple growers of the Valley of Virginia are planning to organize a co-operative marketing association to be operated along the lines of the Georgia Fruit Exchange, which has proved such a great success in enabling the Georgia peach growers to get the best prices for their fruit through scientific marketing methods. At a meeting of growers and representatives of the freight and transportation departments of Southern Railway the workings of the Georgia Fruit Exchange were explained by Howell Peoples, market agent for Southern Railway at Washington, who was formerly division freight agent at Macon, Ga., and a committee of growers was named to consider the organization of a similar association.

For Supplying Fertilizer Material.

Organization has been effected by the recently chartered Northwestern Mining & Fertilizer Co., Fayetteville, Ark., with officers as follows: President, A. H. Markle; vice-president, Dan Coleman; secretary, Frank M. Kennedy; treasurer, Tom Kennedy. This company writes to the MANUFACTURERS RECORD: "We hold deeded and leased lands, practically 20,000 acres, in Carroll, Marion, Neuton, Madison and Washington counties. Minerals being mined are nitrate of potash, chloride of potash and guano. Our object is to supply the manufacturer with fertilizer material. We are now in a position to fill orders in carload lots of 20 tons or over."

To Develop Arkansas Tripoli Property.

From 40 to 200 acres of tripoli land in Pike county, Arkansas, will be developed by the W. C. Ross Manufacturing Co. of Little Rock, referred to last week. This company manufactures disinfectants, polishes, liquid soaps, etc., and owns the tripoli property for its own use. It intends to install mining machinery and mills for a daily capacity of about 30 to 50 tons, and estimates the tripoli deposits at from 1,000,000 to 5,000,000 tons. W. C. Ross is the company's president, and C. W. East is secretary, the latter being now prepared to correspond with manufacturers of the machinery required for the mining and milling.

A \$2,000,000 Coal Company.

Capitalized at \$2,000,000, the Liberty Coal Co. of Fairmont, W. Va., has been incorporated by Josiah V. Thompson, Robert Powell and Ewing A. Hibbs of Uniontown, Pa.

According to the Metropolis of Miami, Fla., it has been discovered that a hard flint rock underlying large portions of the Everglades is eminently suited to pavement and general concrete purposes, and that the discovery may result in a saving of \$120,000 to Miami in the cost of its proposed paving.

Under the auspices of the Cleveland (O.) Chapter, American Institute of Banking, George A. Everson, secretary, an exposition will be held in that city, November 14-21, for the display of apparatus and methods for eliminating waste and promoting economy and efficiency in business.

Paper-making in Mississippi is likely to be furthered by the wide adoption of the purpose, already announced by a number of newspapers of the State under the inspiration of Commissioner of Agriculture H. E. Blakeslee to publish in the week of October 5 editions on paper made in Mississippi.

California products, consisting of canned fruits, dried fruit, wine, etc., are now arriving in the Eastern markets via the Panama Canal.

"More Work and Less Talk."

Under this suggestive thought embodied in the heading, Mr. J. B. Haman in the Wilmington (N. C.) Star says:

"Taken as a whole, the people of the South are slow to action, and in the matter of inventing and putting in operation a plan to overcome the present conditions created in the cotton world by the war in Europe they are proving that fact.

"The United States Government has certainly done its share toward aiding the cotton interests to market this year's crop of the staple. Secretary McAdoo has promised to place money in the National banks throughout the South to help finance the crop; he has agreed to lend this money to the banks upon warehouse certificates for cotton put in storage, and he will lend the maximum on every bale.

"This emergency has come quickly, and the people of the South must act as quickly to relieve it. In some sections cotton is already being picked, and before many weeks we will be in the midst of the cotton harvest. There has been a lot of talking, a lot of conferences and a lot of advice, but none of these will get you one cent on your cotton when you most need it unless you have a bonded warehouse somewhere to store it. The warehouse plan has met with the general approval of all connected with the cotton business, and has been accepted by the National Government. That being the case, why is it necessary for additional conferences to be called, more oratory to be wasted and more time lost from the building of the warehouses, through which medium the South alone stands some chance of breaking even on this year's crop of cotton?"

It is not even necessary that the warehouse should be bonded, though that ought to be done, so far as the Secretary of the Treasury is concerned. The Southern banks, by forming themselves into currency associations, can loan on warehouse receipts and have these warehouse receipts, with notes attached, accepted by the Treasury Department for the issuing of currency under the Aldrich-Vreeland act as amended. It is up to the South now, with this vital aid, to work out its own salvation. Will it act quickly, or will it lack initiative and resourcefulness?

Illustrating Southern Opportunities.

"The Farm, Factory and Home Country" is the title of a very attractive illustrated booklet which has just been issued by the Mobile & Ohio Railroad and Southern Railway in Mississippi for the purpose of placing the advantages of the rich country served by these lines before prospective homeseekers and investors. This booklet will be handed visitors to the exhibits which the Mobile & Ohio and Southern Railway in Mississippi will make at fairs and expositions in the North and West this fall in connection with Southern Railway and affiliated lines, and will also be given a general distribution over the entire country. Illustrated with views showing what the thrifty people in this section are accomplishing in agriculture, stock-raising and manufactures, the booklet treats in detail of the territory, its physical divisions, soils, climate and products, its resources, activities and industries and its vast opportunity for the homeseeker and the manufacturer. The section is described as being especially inviting for new people and new capital at this time on account of present low-priced lands, cheap labor and good nearby markets.

Textile Industry in Belgium.

Conditions in the cotton-spinning industry of the consular district of Ghent during the past year have been far from satisfactory, according to United States Consul H. Albert Johnson. The climatic conditions reported as especially favorable in the case of the new crop of cotton appeared to have stimulated activity in the market to a considerable extent, when a general strike brought business almost to a standstill. The strike itself was of relatively short duration, but it aroused such serious misgivings concerning its possible effects that it partially paralyzed the industries of this district as well as those of other sections of the country, and the demand for cotton yarns declined to an alarming extent, while prices dropped to an abnormally low level.

GOOD ROADS AND STREETS

WHAT AMERICAN ROAD CONGRESS MEANS TO THE SOUTH

By LOGAN WALLER PAGE, President, American Highway Association; Director, United States Office of Public Roads.

What the American Road Congress means to the South can only be explained by setting forth in some detail the scope and purpose of the road movement from each of its many angles.

From the standpoint of the engineer the movement for better roads is interesting so far as it relates to the various methods of construction and maintenance of roads, as well as of bridges. During the last few years, since the use of bituminous and other special binders has developed, the chemist has become a prominent factor in the determination of methods and the selection of materials. The regulation of a varied and increasing traffic and the adaptation of various road surfaces to meet traffic requirements have attracted the attention of economists, of experts on traffic regulation, and of State officials having to deal with traffic regulation. Incidentally, the great body of road users has become interested in those measures which restrict the use of the road, and which involve the assessment of a financial burden in the form of license fees. The location of materials and the determination of their qualities involves a very direct application of the science of geology, of chemistry, and also brings into play the knowledge of the mechanical engineer in the making of physical tests.

Back of all the problems which are directly involved in the consideration of methods of construction and maintenance are the even more important problems of legislation, of administrative organization, and of finance. It must not be overlooked that no adequate progress can be made in road improvement without efficient and comprehensive road legislation, and this fact should insure the attention of every legislator for any movement designed to aid in the proper revision and simplification of road laws. The financing of road improvement involves the whole field of taxation, whether it be direct property taxes, enforced labor, the collection of license fees or any other form of raising revenue whatsoever. In the matter of bond issues, it may be pointed out that there are now outstanding in the United States about \$500,000,000 worth of highway bonds. Financial operations on such a scale are worth the attention of banking interests, for most of this is handled through banks. The annual outlay for road construction and maintenance in the United States is over \$205,000,000. This great tax burden is such as to justify the most careful study by public officials with a view to obtaining the greatest possible efficiency from the outlay. It is worthy of attention on the part of all taxpayers, for it is they who pay the bill. According to conservative estimates, considerably more than 100,000 road officials have to deal with the management and direction of the public roads. These men should hold office by merit, and not by political caprice, and hence this phase of the subject is worthy of consideration by all civil service reform advocates.

Just now the exceedingly important question of what shall be done with our convicts is demanding attention at the hands of legislators, as well as the experts in the science of penology. The day of the iniquitous lease system is passing, and the demand is insistent for the utilization of convicts in works of public improvement.

Back of and beyond all of these important questions to which I have referred are those vital questions which affect the welfare of our people individually and in the aggregate. With half of our population crowded into cities and with hundreds of millions of acres of land uncultivated, the problem becomes serious of how to restore that ratio between city and country population which will insure a wise balance between production and consumption and retain our high physical, moral and mental standard of citizenship. This growing disparity between city and country population has much to do with the constantly-increasing cost of living. Lack of good roads is a serious handicap to the operation of our free school system with a resultant limitation in the educational endowment of young men and women from rural sections, while it is a well-known fact that the country church is seriously affected by the condition of the roads, which makes or mars the attendance at religious services. Altogether, it must be evident to the most

casual student of the subject that road improvement is a subject which touches human welfare at every angle, and which should receive serious and thoughtful consideration of men and women in every walk of life.

How, then, is the American Road Congress, which will be in session in the city of Atlanta during the week of November 9, to benefit the South? In connection with the building of improved roads, for which the Southern States are now expending more than \$50,000,000 a year, the South will receive untold benefit from the great wealth of technical knowledge and experience which highway engineers will make public in papers and discussions, and in personal conversation during the week of the Congress. The foremost authorities on every method of construction and maintenance will go to Atlanta for that week from nearly every State in the Union.

Just now the South is in a formative stage in the creation of an adequate legislative foundation upon which to build her system of good roads. At the American Road Congress will be held a session devoted to this important subject, under the auspices of the American Bar Association and the American Highway Association. During the last 12 months the most exhaustive researches have been made and a compilation prepared embodying all existing road legislation. Definite recommendations will be made as to the line along which revision should proceed. This assistance will be most helpful to Southern legislators, and they should not miss the opportunity to be present.

Southern counties are expending millions of dollars in bonds for road improvement. There are many basic essentials which should be taken into account whenever it is proposed to issue bonds. Many records of success or failure in this particular field are traceable to ignorance or neglect of these basic questions. Thus, counties which are contemplating the issuance of bonds should be represented at the Congress and hear the discussion of the whole subject of financing road improvement by the men who have made this a profound study.

The South has been the greatest exponent of the use of convict labor in road improvement. The conditions under which this labor is most productive, the organization and equipment which has proven effective and economical, the most successful methods of lowering cost and all other phases of the convict question will be threshed out most thoroughly at the Congress.

The elimination of politics from road management, the substitution of skilled supervision and the appointment of road officials under a merit system will be discussed and urged at a session to be held under the auspices of the National Civil Service Reform League. Those who are striving for civic righteousness should attend the congress and give the weight of their approval and influence to this commendable undertaking.

If the good-roads question is one which deserves attention from the men of the South, it is equally important from the standpoint of the women of the South. The isolation and dreariness of farm life, where communication with neighbors, with school and with church is cut off for months in the year by reason of bad roads are causes sufficient to induce the women to rise up in their might and demand that these conditions cease. The women will have an opportunity to express themselves on this great question, as there has been arranged a woman's auxiliary meeting during the week of the congress, under the auspices of the Woman's Department of the American Highway Association.

The congress will be the great forum for the discussion of important questions of public policy relating to roads and a training school where will be taught the solution of important road problems by lectures, by demonstrations and by discussions. Almost of equal importance from the standpoint of instruction, by the object-lesson methods, will be the impressive exposition of road materials, machinery and engineering instruments, occupying the great auditorium and at least three city blocks of temporary structure. Here road builders and the public officials, who are responsible for the expenditure of road funds, will have an opportunity to study and critically compare all known machinery,

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devices, methods and equipment used in the construction, maintenance and repair of roads and bridges. The Office of Public Roads of the United States Department of Agriculture will exhibit two series of miniature models, one series showing the development of road building from the early Roman roads to the types of roads now in use, the other series showing all modern types of road, such as sand-clay, gravel, waterbound macadam, bituminous macadam, brick concrete, etc. The exhibit will also include models of bridges, culverts and drainage structures, electrically-operated models of rollers, crushers, etc., as well as moving pictures, automatic stereopticon and many interesting wall pictures.

The great railroad systems have made the Congress easy of access, for they have granted a reduced rate of three cents a mile for the round trip in the whole south-eastern territory.

Arrangements for the congress are being rapidly completed at the offices of the American Highway Association, which, together with the American Automobile Association, is in direct charge of the great meeting. I. S. Pennybacker, secretary of the American Highway Association, is executive secretary of the congress, and has offices in the Colorado Building at Washington, D. C., and at the same offices Charles P. Light, the business manager of the exposition, is carrying forward arrangements for the exposition.

SOUTHERN HIGHWAY ACTIVITIES.

Details of Week's Progress in Improvements in City and Country.

Further details of road and street undertakings and bond issues mentioned below are given under the headings Construction Department and New Securities, published elsewhere in this issue.

The MANUFACTURERS RECORD invites from its readers information about road and street work projected or under way, photographs of good roads and discussions of matters pertaining to the betterment of the highways of the South.

Bonds Voted.

Fort Meade, Fla.—City voted \$25,000 bonds to pave streets; expend total of \$75,000.

Mt. Dora, Fla.—City will issue \$12,000 street-paving bonds.

Paris, Tex.—Lamar county will issue \$50,000 for road improvements.

Bonds to Be Voted.

Greenup, Ky.—Greenup county will vote on \$200,000 bonds to improve roads.

Contracts Awarded.

Baltimore, Md.—City awarded \$25,203.86 paving contracts.

Belton, Tex.—Road District No. 7 of Bell county let \$105,000 contract to construct 40 miles of gravel roads.

Dallas, Tex.—City let contract to lay 13,600 square feet concrete sidewalk and 8800 linear feet combination concrete curb and gutter in Fair Park.

Dyersburg, Tenn.—City let contract to pave 13 streets with asphalt.

Houston, Tex.—City let contracts totaling \$18,150 for street paving.

Huntington, Tenn.—City awarded contract to gravel one mile of street.

Huntington, Tenn.—City let \$5000 contract to macadamize one mile street.

Knoxville, Tenn.—Knox county let \$2000 contract to macadamize road.

Knoxville, Tenn.—Knox county awarded \$9377.55 contracts for road improvements.

Miami, Fla.—City let contracts for 54,000 square yards asphalt paving.

Pikeville, Tenn.—Bledsoe county let contract to construct 40 miles of road, costing \$92,000.

Richmond, Va.—City let \$10,000 contract for asphaltic concrete paving.

San Marcos, Tex.—A. M. Clopton has \$12,700 contract to build 6¾-mile road in Kyle Precinct.

Wheeling, W. Va.—Ohio county let contracts to improve 59,000 square yards roads.

Contracts to Be Awarded.

Alexandria, Va.—City appropriated \$9800 to pave two squares with vitrified brick and construct granolithic sidewalks.

Bay St. Louis, Miss.—Hancock county opens bids September 7 to maintain 250-mile road.

Caldwell, Tex.—City has \$20,000 available for paving, curbing and guttering.

Hillsboro, N. C.—Orange county opens bids Sept. 14 to grade five miles of road.

Mr. Pleasant, Tex.—City has \$16,000 available for street improvement.

Richmond, Va.—City opens bids September 15 for 113,000 square yards smooth paving, 6000 square yards granite block paving, etc.

Salisbury, Md.—City opens bids September 7 for 12,500 square yards vitrified brick, bituminous concrete or bitulithic pavement.

American Road Builders.

The annual meeting of the American Road Builders' Association will be held at the International Amphitheater, Chicago, Ill., December 14-17. The program is being arranged with especial reference to making it of the greatest interest and the utmost practical value to men actually engaged in road and paving construction as officials, engineers or contractors. The members of the program committee are: W. A. McLean, chairman, chief engineer of highways and commissioner of the Ontario Public Roads and Highways Commission, Toronto, Ont., Canada; Geo. W. Tillson, consulting engineer to the President of the Borough of Brooklyn, N. Y.; R. A. Meeker, State Highway Engineer of New Jersey, Trenton, N. J.; E. L. Powers, editor of Good Roads, New York, N. Y.; Major W. W. Crosby, chief engineer of the Maryland Geological Survey, Baltimore, Md.; William H. Connell, chief of the Bureau of Highways and Street Cleaning, Philadelphia, Pa.; C. A. Kenyon, member of the Indiana Advisory Commission, Indianapolis, Ind., and A. N. Johnson, Bureau of Municipal Research, New York, N. Y.

The committee in charge of the exhibition—the Sixth Good Roads Show—is preparing some especially unique and interesting features. The manufacturers of machinery and materials are evincing great interest in the exhibition, as is indicated by the large amount of space already applied for. The officials of the association are confident that this year's show will far excel anything of the kind ever attempted before. This belief is based upon the most fortunate geographical position of Chicago, which makes it accessible from all points of the country, and the fact that the International Amphitheater, in which the show will be held, has facilities for a show of this kind equal to those of any similar building in the United States. Another indication of the success which may be expected is the great enthusiasm with which the matter is being taken up by officials, organizations and private citizens in Chicago.

A \$105,000 Road Contract.

The contract to construct 40 miles of gravel roads in Bell county, Texas, for which bids were recently invited, has been awarded at \$105,000 to A. M. Clopton of Belton, Tex. This contract was awarded by the Commissioners of Road District No. 7 of Bell county.

For 40 Miles of Road.

Contract for 40 miles of road has been awarded by the Bledsoe County Commissioners, Pikeville, Tenn. It amounts to about \$92,000, and calls for clearing, grubbing, excavation, masonry, concrete, pipe and bridges.

Two Large Contracts.

The city of Miami, Fla., has let contracts for about 54,000 square yards asphalt paving, and the Ohio County Commissioners, Wheeling, W. Va., have let contracts for improving 59,000 square yards roads. Proposals were recently invited for these improvements.

RAILROADS

[A complete record of all new railroad building in the South will be found in the Construction Department.]

NASHVILLE TO CORINTH.

\$1,000,000 Subscription Proposed for Railroad by Davidson County, Tennessee.

An important step toward the construction of the projected Nashville, Shiloh & Corinth Railroad from Nashville, Tenn., to Corinth, Miss., about 150 miles, has been taken by the filing of a petition in the Davidson county (Tennessee) court, in which county Nashville is located, for an election on a proposed subscription of \$1,000,000 to the 3 per cent. preferred capital stock of the railroad company. Clopton C. Thomas, Corinth, Miss., secretary of the railroad company, filed the document. Already several counties have voted a total of \$750,000 of bonds to aid the construction plans. It is expected that the election in Davidson county will be held early in October. If the subscription carries, it is provided that it may be made in either cash or in 4 per cent. county bonds. The court will meet September 8 to act upon the petition, which is signed by Allen W. Jones of Augusta, Ga., who is a railroad contractor and who is also president and one of the organizers of the railroad company.

It is provided that none of the subscription shall become due or payable until that part of the proposed railroad within the limits of Davidson county is completed and in operation. Construction must begin within six months after the date of the subscription and this part of the road must be finished within two years from the same date. The entire road must be completed within three years from January 1, 1915. It must be of standard gauge, and the main line must be laid with rails of weight not less than 80 pounds per yard, ties to be hardwood and not less than 2816 per mile. All bridges must be of steel. Maximum grade not over 1¼ per cent. and curvature not over 6 degrees. Principal shops must be built in Davidson county.

The petition was filed only after a general consideration of the railroad proposition by representatives of the several leading business organizations of Nashville, at which County Judge W. M. Pollard, E. B. Stahlman and John A. Pitts, the latter representing the railroad, were also present.

Large Railroad Yards.

Construction of the Radnor yards of the Louisville & Nashville Railroad immediately south of Nashville, Tenn., has begun, and a force of considerable dimensions is already at work. These yards, when complete, will be three miles long and about half a mile wide. It is proposed to lay 42 miles of tracks at first, and it will be one of the greatest assembling and classification yards in the country. It will be of the hump type, and there will be six sections of it separated into two grand divisions, the latter for northbound and southbound freight, respectively.

A large roundhouse and repair shops will be located at Radnor, the former having capacity for 30 engines at first, but with space reserved to erect another section of the building to make a total of 60 stalls for as many locomotives.

This road is locally known as the Lewisburg & Northern, but it is the Louisville & Nashville's new double-tracked line from Nashville to Athens, Ala., which was recently completed.

Donaldsonville to Lockport.

Walter Ohlmeyer, Plattenville, La., writes to the MANUFACTURERS RECORD that the Louisiana Railway, Light & Power Co. is being promoted by him, together with Dr. H. S. Smith, Albert Boudreaux and Alfred Picot of Thibodeaux, La. They propose to build and operate an interurban electric railway and to furnish light and power along the Bayou Lafourche between Donaldsonville and Lockport, La., 56 miles, through a very thickly settled country. In addition to the two

towns named, there are on this route Fort Barrow, Belle Alliance, Belle Rose, Klotzville, Painscourtville, Plattenville, Napoleonville, Bertie, Labadieville, Thibodeaux, Lafourche Crossing and Raceland. About eight miles from Raceland is Houma, a place of more than 6000 population.

Continuing, Mr. Ohlmeyer says that they have purchased private rights of way; surveys, maps, etc., have been made, as well as engineer's report as to the cost of construction and the probable earning power of the road. The latter, it is said, shows very well, and the construction cost is low on account of the line traversing very level country. No clearing will have to be done and very few bridges will have to be built. While several financing and engineering firms have gone over the proposition, the promoters have not yet closed with any of them, but are negotiating with a large engineering corporation for construction, with a prospect of soon signing contracts. Organization is not yet completed.

To and From Mexico.

Telegrams from N. M. Leach, general traffic manager of the Texas & Pacific and International & Great Northern railroads, and H. C. Dinkins, Latin-American agent of the Gould Lines to the Missouri Pacific-Iron Mountain Railway system, assert that affairs in Mexico have reached a state where traffic with the United States is being resumed. Arrangements have been made with the Constitutionals for an interchange of traffic between the Gould lines and the Mexican railways at Laredo. All freight, both ways, is transferred in the International & Great Northern yards at Laredo. As there are no through rates in effect, through bills of lading cannot at present be issued to or from points in Mexico. Bills of lading will be issued only to and from the Mexican border at Laredo, and it will be necessary for shippers to make their own arrangements for the payment of freight charges, transfer of equipment, custom-house entries, bills of lading to destination, etc. Mr. Leach states that Mr. Denike, customs agent at Laredo, is prepared to handle all matters of this kind.

Mr. Dinkins, who has just returned to San Antonio from Monterey, Mexico, wires that they are operating the bridge at Laredo, and a daily passenger train is being run from that point in Texas to Saltillo, Mexico. He expects the line to be open within a few days for general business to Mexico City. At present passengers for that point are laying over at Monterey and San Luis Potosi.

New Equipment, Etc.

Louisville & Nashville Railroad, says a report from Decatur, Ala., will build 1200 freight cars in its shops there, starting work immediately.

Chesapeake & Ohio Railway is in the market for 30 cabooses with steel underframes.

Atlanta, Birmingham & Atlantic Railway has ordered 5 Mikado type locomotives from the Baldwin Works, Philadelphia.

Parkersburg, Marietta & Interurban Railway has ordered 2 all-steel electric interurban cars from the Cincinnati Car Co., Cincinnati, O.

Carolina & Northwestern Railway contemplates purchasing 100 box cars of 30 tons capacity.

Baltimore & Ohio Railroad is in the market for 30 passenger cars.

Winston-Salem Southbound Railroad is in the market for 35 freight cars.

New Orleans, Texas & Mexico Railroad, according to a report from New Orleans, is converting all its passenger engines from coal to oil burners at its shops in De Quincey, La.

A Farmers' Railroad.

The Rosston, Grand Rapids & Protection Railroad Co. has been organized at Doby Springs, Okla., according to a report from Alva, in the same State, to build a farmers' railway from a connection with the Wichita Falls & Northwestern Railway near Rosston to Doby Springs, 12 miles. A survey has been made and Rosston has pledged \$24,000 for the construction, and a townsite of 80 acres has been given by Doby Springs. It is estimated that the cost of grading and laying track all ready

for operation, but not including equipment, will be about \$67,000, and to raise the full amount it is proposed to solicit subscriptions from farmers and others residing in the region to be benefited.

The organizers are residents of Alva, as follows: L. A. Walton, president and general manager; J. H. Butler, secretary; J. D. Scott, treasurer. Mr. Walton is quoted as saying that many farmers have given donations of from \$100 to \$500, saying they were willing to pay that for the line and would not ask for any stock; also that there would not be any difficulty in raising the necessary funds. It is intended to organize a construction company and to build the railroad with labor obtained in the immediate vicinity of the route, which lies through a prosperous farming section.

More Double-Tracking.

The Southern Railway has awarded contracts for the construction of 36 miles of second track on the Danville division between Greensboro and Pelham, N. C., which will give it a continuous double track across North Carolina from Charlotte all the way to Danville, Va.

The Parker-Brooks Construction Co. of Greenville, S. C., has been given the contract for that part of the work between mileposts 248 and 263, and the Morrow Construction Co. of Atlanta has the work between mileposts 263 and 284.

The first section let is from Pelham to Reidsville and the second from Reidsville to Denim, which is several miles north of Greensboro.

The letting of these contracts makes a total of 75 miles of second track construction which the company has awarded within the last few weeks, this including 39 miles in Virginia, thus: Between Charlottesville and Arrowhead, 7 miles; Elma and Amherst, 19 miles; Dry Fork and Danville, 13 miles.

Contracts have also been let recently on affiliated lines of the Southern thus: Twenty-one miles on the Alabama Great Southern Railroad between York, Ala., and Meridian, Miss., and 9 miles on the Cincinnati, New Orleans & Texas Pacific Railway between New River and Sunbright, Tenn.

East & West Coast Line.

Construction of the East & West Coast Railroad from Manatee and Bradentown to Arcadia, Fla., 52 miles, is proceeding satisfactorily, according to a report from Bradentown, which says that 16 miles of tracks have been laid out from there, and it is reported that the entire road will be finished within 60 days. Bridges have been built over Miakka Creek and Horse Creek, and the bridge over Brandy Creek is being erected. Only one more bridge, that over Peace River, is to be built. All grading is done. Allen W. Jones of Augusta, Ga., is building the line.

Extension for New Orleans.

Concerning a report from Jackson, Miss., that the New Orleans, Mobile & Chicago Railroad had filed there maps showing its projected extension from Beaumont to Ansley, Miss., to connect with the Louisville & Nashville Railroad for entrance to New Orleans, W. F. Owen, receiver of the line, says it is impossible to state at present when construction will be undertaken.

A Railroad Dock.

M. F. Cabill, 1641 Market street, Jacksonville, Fla., is building a dock for the Atlantic Coast Line on the St. John's River there, contract including the furnishing of material. The dock is 100x400 feet, and about 1200 piles must be driven. About 500,000 feet of lumber will also be used. The work is about 50 per cent. completed, and it will cost approximately \$20,000.

The Florida Citrus Exchange estimates that 7,651,514 boxes of citrus fruit were shipped from the State in the season recently closed.

TEXTILES

[A complete record of new textile enterprises in the South will be found in the Construction Department.]

Correspondence relating to textile matters, especially to the cotton-mill interests of the South, and items of news about new mills or enlargements, special contracts for goods, market conditions, etc., are invited by the MANUFACTURERS' RECORD. We shall be glad to have such matters at all times, and also to have any general discussion relating to cotton matters.

New Textile Building of North Carolina College.

The North Carolina College of Agriculture and Mechanic Arts, West Raleigh, has completed its textile school building to replace the structure burned several months ago. This new building, see accompanying illustration, is constructed in accordance with the plans prepared by D. A. Tompkins & Co. of Charlotte when the



original structure was erected. It is of mill construction, 150x75 feet, costing about \$25,000. Its machinery will include 550 spindles, 24 looms, 3 knitting machines, etc., driven by electric power, the plant being intended only for instructive purposes. Professor Thomas Nelson is in charge of this department, and D. H. Hill is president of the college.

To Knit Hosiery and Underwear.

A mill for knitting hosiery and underwear will be built at Forest City, N. C., by the Wilkie-Tanner Mfg. Co. This company has been incorporated by C. A. Wilkie of Forest City, K. S. Tanner of Rutherfordton, N. C., and Morehead Jones of Charlotte, N. C.

Textile Notes.

C. G. Schellenberger, Battle Creek, Mich., is seeking a location for a silk mill to employ several hundred hands, to utilize water-power.

It is reported that the Elk Cotton Mills, Fayetteville, Tenn., will build a No. 2 mill and install 10,000 spindles, 300 looms, etc., for the production of flat duck.

Chamber of Commerce, E. B. Bloom, secretary, Pine Bluff, Ark., is negotiating with a North Carolina manufacturer planning to establish a \$60,000 cotton factory.

Harrison Bros., care of Union City Waterproofing Co., Union City, Tenn., have not decided upon location of waterproof cloth mill lately noted proposed for establishment at Fulton, Ky.

Loudon (Tenn.) Hosiery Mills will build an addition, and H. L. Huntington of Chattanooga is preparing the plans. This new structure will be 168x62 feet, one story, with basement, of fireproof construction, reported to cost \$15,000.

Variety and Extent of Machinery and Equipment in Producing Baltimore's Modern Municipal Facilities

In the vast construction activities now in progress in Baltimore are to be found striking illustrations of the wide variety and great extent of machinery and general equipment required in modern city building work. With a view to indicating how many interests are identified in construction activities with such work as is in progress here, as detailed in Part II of this issue, we have compiled a list of the concerns that have sold machinery or other products to Baltimore during this period, and of contractors who have been identified with some part of these operations. It is probable that this list, as full as it is, may not include every concern, as reports were not received from all of whom inquiries were made, but the list as it stands is interesting as showing how many are the ramifications of construction work in city building.

MACHINERY AND EQUIPMENT

Boilers

Nagle Engine & Boiler Works, Erie, Pa.
Ames Iron Works, Oswego, N. Y.
Gelsner Manufacturing Co., Waynesboro, Pa.
Babcock & Wilcox Co., New York, N. Y.
Fitzgibbons Manufacturing Co., Oswego, N. Y.
Orr & Sombower, Reading, Pa.
Edge Moor Iron Co., Edge Moor, Del.

Boring Mill

Betts Machine Co., Wilmington, Del.

Bridge and Viaduct Steel Work

McClintic-Marshall Company, Pittsburgh, Pa.
Roanoke Bridge Co., Roanoke, Va.
Horace E. Horton Bridge & Iron Works, Chicago, Ill.
Dietrich Bros., Baltimore, Md.

Buckets

G. L. Steubner Iron Works, Long Island City, N. Y.

Bucket Elevator

Link-Belt Company, Philadelphia, Pa.

Cable (Steel)

Macomber & Whyte, Chicago, Ill.

Cars (Dump)

Continental Car & Equipment Co., Highland Park, Louisville, Ky.
Kilbourne & Jacobs Manufacturing Co., Columbus, O.
Orenstein-Arthur Koppel Co., Koppel, Pa.

Cars (Industrial)

Orenstein-Arthur Koppel Co., Koppel, Pa.
Western Wheeled Scraper Co., Aurora, Ill.

Cement Gun

New York Cement Gun Co., Inc., New York, N. Y.

Chemical Laboratory Equipment

Kewaunee Manufacturing Co., Kewaunee, Wis.

Coal-Handling Plant

Dietz Engineering Co., New York, N. Y.

Compressed Air Outfits

Ingersoll-Rand Company, New York, N. Y.
Bury Compressor Co., Erie, Pa.
Westinghouse Machine Co., East Pittsburgh, Pa.
Chicago Pneumatic Tool Co., Chicago, Ill.
Westinghouse Air Brake Co., Wilmerding, Pa.
American Air Compressor Works, Brooklyn, N. Y.

Concrete Distributing Chutes

Insley Manufacturing Co., Indianapolis, Ind.

Concrete Mixers

T. L. Smith Co., Milwaukee, Wis.
Foote Concrete Machinery Co., Nunda, N. Y.
Hains Concrete Machinery Co., Washington, D. C.
Municipal Engineering & Contracting Co., Chicago, Ill.
Chicago Concrete Machinery Co., Chicago, Ill.
Ransome Concrete Machinery Co., Dunellen, N. J.
Knickerbocker Company, Jackson, Mich.
Lakewood Eng. Co., Cleveland, Ohio.
Koehring Machine Co., Milwaukee, Wis.
Waterloo Cement Machinery Corp., Waterloo, Iowa.
Chain Belt Co., Milwaukee, Wis.

Conveyors

Jeffrey Manufacturing Co., Columbus, Ohio.
Insley Manufacturing Co., Indianapolis, Ind.
Link-Belt Co., Philadelphia, Pa.

Cranes

Industrial Works, Bay City, Mich.
Browning Engineering Co., Cleveland, Ohio.
Southwark Foundry & Machine Co., Philadelphia, Pa.
Alliance Machine Co., Alliance, Ohio.

Crushers

Power Mining & Machinery Co., Milwaukee, Wis.
Universal Road Machinery Co., Kingston, N. Y.
Good Roads Machinery Co., Kennett Square, Pa.

Derrick

American Hoist & Derrick Co., St. Paul, Minn.
Jacob Shannon Co., Philadelphia, Pa.

Dises

Hemming Manufacturing Co., Garfield, N. J.

Dredge (Suction)

Maryland Dredging & Contracting Co., Baltimore, Md.

Drills (Rock)

Murphy Drill Co., New York, N. Y.
McKiernan-Terry Drill Co., New York, N. Y.
Ingersoll-Rand Company, New York, N. Y.
Sullivan Machinery Co., Chicago, Ill.

Economizers

Green Fuel Economizer Co., Matteawan, N. Y.

Electrical Machinery and Supplies

ARC LAMPS
Adams-Bagnall Electrical Co., Cleveland, Ohio.
General Electric Co., Schenectady, N. Y.
CABLE WIRE (HIGH TENSION)
General Electric Co., Schenectady, N. Y.
GENERATORS
Allis-Chalmers Company, Milwaukee, Wis.
Fort Wayne Electric Co., Fort Wayne, Ind.
General Electric Co., Schenectady, N. Y.
Wagner Electric Manufacturing Co., St. Louis, Mo.
Westinghouse Elec. & Mfg. Co., Pittsburgh, Pa.
MOTORS
Crocker-Wheeler Company, Ampere, N. J.
Westinghouse Elec. & Mfg. Co., Pittsburgh, Pa.
Relliance Electric & Engineering Co., Cleveland, Ohio.
General Electric Co., Schenectady, N. Y.
"PAISTE TABLETS"
H. T. Paiste Company, Philadelphia, Pa.
PANEL BOARDS
Fort Wayne Electric Co., Fort Wayne, Ind.
General Electric Co., Schenectady, N. Y.
Wagner Electric Manufacturing Co., St. Louis, Mo.
STEAM TURBINE-DRIVEN CENTRIFUGAL PUMPS,
TURBO-GENERATOR SETS
General Electric Co., Schenectady, N. Y.
SWITCHBOARDS
Sterling Switchboard Co., Philadelphia, Pa.
General Electric Co., Schenectady, N. Y.
TRANSFORMERS
General Electric Co., Schenectady, N. Y.
Moloney Electric Co., St. Louis, Mo.
WIRING
Central Electric Co., Chicago, Ill.

Elevators

Otis Elevator Co., New York, N. Y.

Engines

Slaysman & Co., Baltimore, Md.
Gelsner Manufacturing Co., Waynesboro, Pa.
Ames Iron Works, Oswego, N. Y.
Reeves Engine Co., Trenton, N. J.

Crushing Engines

Chandler & Taylor Co., Indianapolis, Ind.
Nagle Engine & Boiler Works, Erie, Pa.

Hoisting Engines

Lidgerwood Manufacturing Co., New York, N. Y.
Lambert Hoisting Eng. Co., Newark, N. J.
J. S. Mundy, Newark, N. J.
American Hoist & Derrick Co., St. Paul, Minn.
A. H. McDonald, Chicago, Ill.
Dake Engine Co., Grand Haven, Mich.

Pumping Engines—Triple Expansion

Bethlehem Steel Co., South Bethlehem, Pa.

Reciprocating Engines

Allis-Chalmers Manufacturing Co., Milwaukee, Wis.

Turbine Engines

Westinghouse Machine Co., Pittsburgh, Pa.
General Electric Co., Schenectady, N. Y.

Excavating Machinery

Hayward Company, New York, N. Y.
Carson Trench Machine Co., Boston, Mass.
Potter Manufacturing Co., Indianapolis, Ind.

Fire Department Equipment and Supplies

AMBULANCE (MOTOR)
The White Company, Cleveland, Ohio.
AUTOMOBILE HOOK AND LADDER TRUCKS
American-La France Fire Eng. Co., Inc., Elmira, N. Y.
AUTOMOBILE HOSE WAGONS
The White Company, Cleveland, Ohio.
International Motor Co., New York, N. Y.
Lord Baltimore Truck Co., Baltimore, Md.
AUTOMOBILE TRUCKS (SUPPLY)
The White Company, Cleveland, Ohio.
International Motor Co., New York, N. Y.
BATTERY PROPELLED TRACTORS
Couple Gear Freight Wheel Co., Grand Rapids, Mich.
CABLES
Standard Underground Cable Co., Pittsburgh, Pa.
National India Rubber Co., Bristol, R. I.
Safety Insulated Wire & Cable Co., New York, N. Y.
FIRE ENGINES, HOSE WAGONS AND GENERAL EQUIPMENT
American-La France Fire Eng. Co., Inc., Elmira, N. Y.

Fire Department Equipment and Supplies—(Con.)

FIRE ALARM SYSTEM
Gamewell Fire Alarm Telegraph Co., New York, N. Y.
GASOLINE TRACTORS
American-La France Fire Eng. Co., Inc., Elmira, N. Y.
HIGH-PRESSURE TRUCK WAGONS
International Motor Co., New York, N. Y.
HOSE
Eureka Fire Hose Co., New York, N. Y.
Fabric Fire Hose Co., New York, N. Y.
Boston Woven Hose & Rubber Co., Boston, Mass.
C. C. C. Fire Hose Co., Canton Junction, Mass.
HOSE WAGON BODIES
Leonhardt Wagon Manufacturing Co., Baltimore, Md.
TRACTORS
Front-Drive Tractor Co., Hoboken, N. J.
Flush Tank Siphons, Water Regulators, Taylor Nozzles
Pacific Flush-Tank Co., New York, N. Y.
Forge Shop Equipment
B. F. Sturtevant Company, Hyde Park, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Garbage Trucks
International Motor Co., New York, N. Y.
Gas Machine, "Climax"
C. M. Kemp Manufacturing Co., Baltimore, Md.
Gate Valves
Ree-Stephens Manufacturing Co., Detroit, Mich.
Globes, "Alba"
Macbeth-Evans Glass Co., Pittsburgh, Pa.
High Pressure Pipe System
Pittsburgh Valve Foundry & Construction Co., Pittsburgh, Pa.
Hydraulic Turbines
S. Morgan Smith Company, York, Pa.
Jacks
A. O. Norton Manufacturing Co., Boston, Mass.
Duff Manufacturing Co., Pittsburgh, Pa.
Barrett Manufacturing Co., Pittsburgh, Pa.
Lamp Posts (Gas)
S. R. Carr & Co., Baltimore, Md.
Lamp Standards
Morris Iron & Steel Co., Frederick, Md.
Central Foundry Co., New York, N. Y.
Lathes
Reed-Prentice Company, Worcester, Mass.
Lime Tanks, Troughs and Screens
Novelty Steam Boiler Works, Baltimore, Md.
Lockers (Metal)
Merritt & Co., Camden, N. J.
Locomotives (Industrial)
Baldwin Locomotive Works, Philadelphia, Pa.
Davenport Locomotive Works, Davenport, Iowa.
H. K. Porter Company, Pittsburgh, Pa.
Vulcan Iron Works, Wilkes-Barre, Pa.
Machine Shop Equipment
Manning, Maxwell & Moore, New York, N. Y.
Fairbanks Company, New York, N. Y.
Pipe
CAST IRON AND MATERIAL
U. S. Cast-Iron Pipe & Foundry Co., Burlington, N. J.
Glamorgan Pipe & Foundry Co., Lynchburg, Va.
REINFORCED CONCRETE (WATER SUPPLY MAIN)
Lock Joint Pipe Co., East Orange, N. J.
SPECIAL AND CAST-IRON FITTINGS AND MANHOLE CASTINGS
Columbian Iron Works, Chattanooga, Tenn.
VITRIFIED
American Sewer Pipe Co., Akron, Ohio.
St. Mary's Sewer Pipe Co., St. Mary's, Pa.
Kaul Clay Manufacturing Co., Toronto, Ohio.
Robinson Clay Product Co., Akron, Ohio.
WROUGHT IRON
W. K. Mitchell & Co., Philadelphia, Pa.

Portable Hydrant Heads, Pump Pressure Regulating Valves

Ross Valve Manufacturing Co., Troy, N. Y.

Pumps

Blake & Knowles Steam Pump Works, New York, N. Y.
A. S. Cameron Steam Pump Works, New York, N. Y.

MISCELLANEOUS

American Paving & Contracting Co., Baltimore, Md.
Andrews, David M., Baltimore, Md.
Baltimore Asphalt Block & Tile Co., Baltimore, Md.
Beach, Martin J., Baltimore, Md.
Consolidated Engineering Co., Baltimore, Md.
Cunningham Paving Construction Co., Philadelphia, Pa.
Curry-Quinn Company, Baltimore, Md.
Cranford Paving Co., Washington, D. C.
Eastern Paving Co., Philadelphia, Pa.
Elder Paving & Contracting Co., Baltimore, Md.
Filbert Paving & Construction Co., Baltimore, Md.
Flanagan & Sons, P., Baltimore, Md.
Long Contracting Co., Geo., Baltimore, Md.
Middleton & Co., N. A. Baltimore, Md.
Mullan, Thomas F., Baltimore, Md.
Quinn, John E., Baltimore, Md.
Reddington & Sons, P., Baltimore, Md.
Schneider Paving Co., F. E., Baltimore, Md.
Southern Paving Construction Co., Chattanooga, Tenn.
Standard Contracting Co., Baltimore, Md.
Union Paving Co., Schenectady, N. Y.
Warner-Quinlan Asphalt Co., Syracuse, N. Y.

Variety and Extent of Machinery and Equipment in Producing Baltimore's Modern Municipal Facilities

BALTIMORE SUPPLY AND EQUIPMENT HOUSES

WHICH SUPPLIED OR DISTRIBUTED SOME OF THE MACHINERY AND MATERIAL NOTED IN THIS LIST.

Al-Lon Manufacturing Co.
 Ammen Machinery Co.
 Automobile Outing Co.
 Baltimore Electrical Supply Co.
 Bartlett-Hayward Company.
 Bates Elevator Co.
 Benedict, E. L.
 Bullock Lime & Cement Co., John S.
 Carey Machinery & Supply Co.
 Caroline Foundry Co.
 Carr, Stuart R. & Co.
 Central Iron & Steel Co.
 Chesapeake Iron Works.
 Clarke & Son, W. W.
 Crook-Kries & Co.
 Canton Lumber Co.
 DeVed & Sons Sash Weight Co.
 Deverell, Spencer & Co.
 Dietrich Bros.
 Eastern Railway Supply Co.
 Eastwick Motor Co.
 Gorsuch & Co., R. H.
 Greenmount Iron & Manufacturing Co.
 Hanline Bros.
 Helae & Bruns.
 Hoffman & Co., R. C.
 Hudson Cement & Supply Co.
 Industrial Iron Works.
 Jameson, McKenzie & Evans.
 Jones Hollow Ware Co.
 Kaiser, Louis E.
 Kennedy's, P., Foundry, and Baltimore Malleable Iron & Steel Casting Co.
 Kugler & Shane.
 Lacy Company, Jas. J.
 Lee Electric Co.
 Louis, John C.
 McNeill Ornamental Iron & Construction Co.
 Maryland Equipment & Supply Co.
 Maryland Lime & Cement Co.
 Matthews & Son, Thos.
 Meyers & Co., Henry H.
 Monitor Heating Co.
 Moore, J. Raymond.
 Motor Car Co.
 Murrill & Kelzer Co.
 National Building Supply Co.
 National Electric Co.
 National Iron Co.
 National Supply Co.
 Newman Electric Co.
 Poole Engineering & Machine Co.
 Reckford, D. B.
 Rosenfeld Electric Co., W. S.
 Rosenfeld & Co., Inc., Eugene I.
 Sexton Stove & Manufacturing Co., S. B.
 Sheppard & Co., Isaac A.
 Slingluff Supply Co.
 Southern Electric Co.
 Standard Lime & Stone Co.
 Stebbins & Sons, Wallace.
 Tapley, Leonard.
 Thomas, George P.
 White Motor Co.
 Wilhelm, T. Frank.
 Williams & Sons, J. W.
 Wilson-Maltman Electric Co.
 Zamolski, Jos. M.

MECHANICAL

Illustrations and descriptions having news value pertaining to developments in machinery, mechanical devices and inventions will be considered for use in this department.

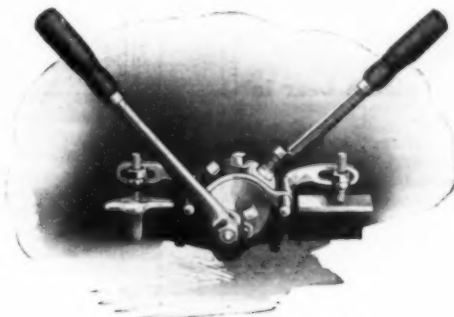
Simplex Roller Die Swage.

A new and useful tool designed for use in saw, planing, stave, boxboard and other woodworking mills and factories, for the swaging of saws used for cutting with the grain of wood, such as band saws, circular saws, gang saws, etc., has been developed by the Peter Gerlach Company of Cleveland, O. The Simplex swage sets saw teeth at any angle from 35 to 50 degrees, although the 45-degree angle is considered to give the best results on all kinds of wood grown in America, whether frozen, green or dry.

Simplex swages are said to be mechanically perfect, strong and true, and every part made of the finest quality of steel. All wearing parts, such as roller dies,

anvils, screws, nuts, washers and their seats are hardened and tempered, with all parts standardized.

The adjusting features of this tool are simple and



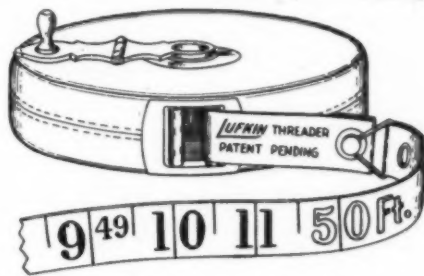
SIMPLEX ROLLER DIE SWAGE.

easily manipulated, and by limiting the throw of the swage lever, the swage is safeguarded against the annoyance of smashing the roller dies and anvils. A new Simplex price-list describing the Simplex swage will be sent to interested persons upon request to the Peter Gerlach Company.

Metallic Tape "Threader."

The Lufkin Rule Co. of Saginaw, Mich., has developed and patented a measuring tape attachment known as a "threader," which will hereafter be furnished with its metallic woven measuring tapes without extra charge.

The threader is a loop and stud arrangement by means of which the tape, though securely fastened to the winding drum of the case when in use, can yet be readily detached from it and a new tape attached, no manipulation of the case, case screw or drum being required to do this.



LUFKIN TAPE "THREADER."

Woven tapes are sometimes torn by accident or through long use often become soiled and worn in such a way that they must be replaced while the case is yet in very fair condition. The case not receiving the same hard use as the tape line usually outwears it, and, representing approximately half the value of the outfit, it is of considerable importance that it be a simple matter for anyone to insert a new tape in the old case as often as necessary and thus get the fullest measure of use out of the case as well as the tape.

The Kahn Curb Bar.

An interesting method of protecting concrete edges of curbs, columns, etc., is illustrated in the design of the new curb bar developed by the Trussed Concrete Steel Co., Detroit, Mich. The company states that the bars are manufactured from a special steel section which is punched and expanded by powerful special machinery and are scientifically designed to meet practical requirements for the protection of concrete edges. It is stated that the highest grade of open-hearth steel is used and all bars are galvanized after forming.

The distinctive features of the Kahn curb bar are: The substantial steel protection offered by a steel plate of ample size to take up all shocks and distribute them throughout the mass of concrete; the positive shoulder affords anchorage, independent of the adhesion of the concrete, and the open anchorage does not separate the concrete and eliminates any tendency to split at the corners; the plates and anchors being of single-section

steel, insure distribution of shocks and prevent separation of the plate from the concrete, and on account of the rigid and convenient size of the Kahn curb bar, it is



KAHN CURB BAR.

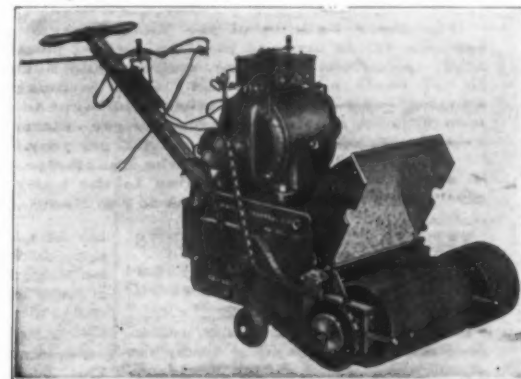
easily handled and installed without special tools and equipment.

Kahn curb bars are furnished curved to any reasonable radius to meet the requirements of street intersections, etc.

Self-Propelled Floor Surfacing Machine.

An automatic, ball-bearing, electric floor surfacing and polishing machine for refinishing old floors, taking off old varnish, paint, etc., and dressing quarter-sawn oak, maple, etc., is manufactured by Wyvell-Chappell & Co. of Chicago, Ill.

The machine is solidly built of heavy parts accurately assembled with steel ball bearings on all running parts of cutting roller, which is covered with fine or coarse sandpaper, and two nine-inch suction fans to which dust sack is attached. The roller may be either flexible for easy adjustment to the floor inequalities or rigid to



FLOOR-SURFACING MACHINE.

level the floor quickly. It is held in place by thumb-screws pressing against cushions.

A special feature of the machine is the mechanism for gauging the depth of the roller cut. This brake-gauge, the bottom of which is of polished wood, of a length to span two ordinary floor boards, slides on the high edges, steadying the machine, and gauges the depth of the cut by firmly holding the handle in any position it has been tilted and locked by the small lever on the handle. It also acts as a brake on the forward pull of the machine. The machines are made in several sizes suitable for small rooms or large areas.

Made in Baltimore.

Plans are rapidly nearing completion for holding in Baltimore from September 17 to October 3 an exposition of products "Made in Baltimore." One of the main purposes of this exposition is to give the people of Baltimore a better idea of the wide range of products of various kinds that are made in the city. So far nearly 100 booths have been taken, and in these Baltimore manufacturers will exhibit their products and demonstrate their manufacture, and in this way bring the people of the city to a keener appreciation of the variety and quality of Baltimore-made goods. The exposition will be held under the auspices of the Maryland Wholesale Grocers' Association, of which Harry C. Grove is president; Christian F. Schoenewole, secretary and general manager, and Norvell E. Miller, treasurer.

The Georgia Chamber of Commerce has called the Southeastern Food Crops Conference to meet in Atlanta October 5 and 6.

Construction Department

IN ORDER TO FOLLOW UP

Properly the Construction Department items, please bear in mind the following statements:

EXPLANATORY

The MANUFACTURERS RECORD seeks to verify the items reported in its Construction Department by full investigation. It is often impossible to do this before the item must be printed or else lose its value as news, and in some items it is found advisable to make statements as "reported" or "rumored," and not as positive information. If our readers will note these points they will see the necessity of the discrimination. We are always glad to have our attention called to errors that may occur.

HOW TO ADDRESS

The name of one or more incorporators of a newly incorporated enterprise should always be written on letter addressed to the official headquarters or to the town of the parties sought, as may be shown in the item. Sometimes a communication merely addressed in the corporate or official name of a newly established company or enterprise cannot be delivered by the postmaster. By following these general directions the postoffice will generally be enabled to deliver your mail promptly, although it is inevitable that some failure by the postal authorities to deliver mail to new concerns will occur, as our reports are often published before new companies are known and before they have any established office for the receipt of mail.

WRITE PERSONAL LETTERS

In communicating with individuals and firms reported in these columns a letter written specifically about the matter reported will receive better and quicker attention than a circular. In most instances a return postal card or addressed and stamped envelope should be enclosed with letter.

In correspondence relating to information published in this department, it will be of advantage to all concerned if the Manufacturers Record is mentioned.

DAILY BULLETIN

The Daily Bulletin of the Manufacturers Record is published every business day in order to give the earliest possible news about new industrial, commercial, building, railroad and financial enterprises organized in the South and Southwest. It is invaluable to manufacturers, contractors, engineers and all others who want to get in touch at the earliest moment with new undertakings, or the enlargement of established enterprises. The subscription price is \$25 per year.

All advertising contracts in the Manufacturers Record for three months or longer include a subscription to the Daily Bulletin for the contract period, as well as a subscription to the Manufacturers Record.

BRIDGES, CULVERTS, VIADUCTS

Ala., Birmingham.—Jefferson County Board of Revenue contemplates construction bridge across Cahaba River near Lovie.

Ala., Birmingham.—City Comms. contemplate construction or securing construction of underpass at Ave. F and 7th St. at Louisville & Nashville and Birmingham Ry., Light & Power Co., railways.

Ala., Decatur.—North Alabama Traction Co. will construct bridge across Tennessee River.

Ark., Monticello.—Drew county will construct bridge over Bayou Bartholomew; steel; 300 ft. long; also considering construction of bridge over Ouachita River on Malvern-Hot Springs Rd. Address County Comms.

Fla., Jacksonville.—Duval County Comms. engaged A. F. Harley, 136 E. Bay St., Jacksonville, to prepare plans, invite bids and supervise construction of bridge across St. John's River.

Fla., Tampa.—Hillsboro County Comms. let contract Edwards Construction Co., Tampa, at \$11,145.55 to construct concrete bridges for roads to be paved; Jas. Riddle, Engr. of Roads. (Lately noted.)

Ga., Americus.—Sumter County Comms. recalled order for election to vote on issuing \$200,000 bonds for bridge construction and road improvement.

Kentucky.—Norfolk & Western Ry., J. E. Crawford, Ch. Engr., Roanoke, Va., let contract Boxley, Haley & Co., Roanoke, Va., to construct 2 bridges and 2 mi. railway on Blackberry Creek; cost \$125,000.

Ky., Pineville.—Bell County Comms. will construct concrete masonry for wagon bridge across Cumberland River, about 2000 ft.; bids until Sept. 11; J. H. Bailey, County Road Engr. (See Machinery Wanted.)

Md., Baltimore.—State Roads Com., 601 Garrett Bldg., let contract to Thomas, Poole & Hunter, Westminster, Md., at \$8177 for construction concrete bridge across north branch of Patuxent River 2 mi. from Ellicott City. (Lately noted inviting bids.

Md., Baltimore.—Gamble Latrobe, Baltimore, Gen. Supt. Northern Central Division of Pennsylvania R. R. Co., A. C. Shand, Ch. Engr., Broad St. Station, Philadelphia,

has let contract to Brown-King Construction Co., Wm. Carey Brown, Prest., Harrison Bldg., Philadelphia, to construct bridge at Eager St. and Fallsview; steel frame covered with concrete; begin work at once. (Lately mentioned.)

Mo., Kansas City.—Wyandotte county, Kan., let contract Kansas City Structural Steel Co., Kansas City, Mo., to construct previously-noted 1635-ft. high-level bridge over railway tracks and Kaw River between Kansas City, Kan., and Kansas City, Mo.; cost about \$480,000.

Tex., Boerne.—City will open bids Sept. 8 to construct lately-noted bridge across Cibola River at Main St.; estimated cost \$3800; low structure of reinforced concrete; length 200 ft.; 18-ft. roadway; Willard E. Simpson, Engr., 208 Washer Bldg., San Antonio, Tex.; bids lately noted. Engineer asks prices on mixer. (See Machinery Wanted.)

Tex., Denison.—City will construct previously-noted 6-ft. walkway bridge over M., K. & T. shops; bids until Sept. 7 on concrete slab flooring and wood-plank flooring; A. B. Clenny, City Engr. (See Machinery Wanted.)

Tex., Fort Stockton.—Pecos County Commissioners let contract L. B. Westerman, Fort Stockton, at about \$24,000 to construct concrete culverts and bridges; Whiteaker & Washington, Engrs., 240 Moore Bldg., San Antonio, Tex. (See Road and Street Work.)

Tex., Houston.—City will construct bridge at Taylor St.; bids until Sept. 7; estimated cost \$12,000; Ben Campbell, Mayor. (See Machinery Wanted.)

Tex., Marble Falls.—City votes Sept. 5 on bonds for bridge construction, etc. Address The Mayor. (See Water-works.)

Tex., Oakville.—Live Oak County Comms. recalled recent order for election on issuing \$100,000 bridge and road bonds. (Lately noted.)

Va., Buckingham.—State Highway Com. let contract C. R. Sanderson & S. W. Parker at \$4529 to construct bridge across Slate River, in Buckingham county.

Va., Hampton.—Newport News & Hampton Ry., Gas & Electric Co. plans construction of trestle replacing present structure over northern neck of Hampton Creek.

Va., Lebanon.—Russell County Comms.

will construct bridge across Lick Creek; 37-ft. steel beam span; cement rubble substructure; 12-ft. roadway; bids until Sept. at office of clerk, Lebanon; further information on application to G. P. Coleman, State Highway Commr., Richmond; Va. (See Machinery Wanted.)

Va., Norfolk.—Norfolk-Berkley Bridge Corp., Paul Garrett, Prest., let contract McClintic-Marshall Co., Pittsburgh, Pa., for construction bridge across eastern branch Elizabeth River between Norfolk and Berkley; cost about \$350,000. (Lately noted organized, etc.)

CANNING AND PACKING PLANTS

Fla., Arch Creek.—Arch Creek Packing Co. (lately noted incpd.), capital stock \$10,000 will operate fresh fruit and vegetable packing plant of 10 cars daily capacity; has building; Wm. Bennett, Prest.; M. J. Sloan V-P.; G. D. Fleming, Secy.-Treas.; asks prices on crate material, etc. (See Machinery Wanted.)

Fla., Auburndale.—Chas. E. Langley and others will organize company to build plant with daily capacity 5000 cans preserved grapefruit and 500 gal. fruit syrup.

Fla., Estero.—Estero Packing Co., capital stock \$3000, incpd. by A. C. Marshall, Sam Scott, Conrad Menge and others.

Ky., Louisville.—Armour & Co., main office, Chicago, will build addition costing about \$4000; brick construction.

Va., Newport News.—Yorktown Fish & Oyster Corp., Yorktown, Va., reported as to establish plant costing \$50,000; facilities to include ice and cold-storage plant, engine-room, fish and oyster storage and packing-house.

Va., Richmond.—Albert Lea Packing Co., authorized capital \$500,000, incpd.: H. H. Chalkley, Prest.; Andrew S. Christian, Secy.

CLAYWORKING PLANTS

Mo., New Florence.—Fire-bricks.—New Florence Fire-Brick Co., capital stock \$30,000, incorporated by S. P. Adams, Howard Ellis and W. J. Gilbert.

N. C., Brickton.—Bricks.—Brickton Brick Co. organized to continue plant of J. C. Sherrill; Prest., D. S. Pace; V-P., C. S. Calvert; both of Hendersonville, N. C.; has 40 acres clay land; also 160 H. P. boiler plant and machinery for daily capacity 50,000 bricks.

N. C., Salisbury.—Bricks.—Salisbury Brick Co., authorized capital \$25,000, incpd. by T. R. Atkinson, A. B. Atkinson, C. S. Reames and M. H. Atkinson.

Tex., Lanus, P. O. at Abilene.—Lanus Brick Works, controlled by First State Bank of Abilene, plans to rebuild shed, kilns, etc., reported burned at loss of several thousand dollars.

COAL MINES AND COKE OVENS

Ala., Scottsboro.—McKenzie Coal Co., capital stock \$7500, incorporated by A. R. McKenzie, John D. O'Connor, J. H. McKenzie and others.

Ky., Manchester.—C. B. Lytle and Cecil B. Donnelly, Manchester, sold 40,000 acres coal and timber land to Scranton (Pa.) capitalists for development.

Ky., Pineville.—Martins Ford Coal Co. increased capital from \$40,000 to \$60,000.

Mo., Novinger.—Davis Creek Coal Co., capital stock \$75,000, incpd. by J. J. Wells and J. J. Rowland of Novinger, L. L. Brand of Chicago and others.

W. Va., Fairmont.—Liberty Coal Co., capital \$2,000,000, incpd. by Josiah V. Thompson, Robt. Powell and Ewing A. Hibbs of Uniontown, Pa., and others.

W. Va., Mountain Cove.—Gaymont Coal Co., capital \$2000, incpd. by C. C. Beury, J. P. Vaughn, A. S. Guthrie, C. C. Lewis, Jr., and D. V. Reese, all of Charleston, W. Va.

CONCRETE AND CEMENT PLANTS

N. C., Salisbury.—Cementile, etc.—Universal Cement Products Co., R. C. Cottan, Mgr., High Point, N. C., will establish plant to mfr. cementile and other cement products; construct building and install machinery.

Tex., San Antonio.—Portland Cement.—San Antonio Portland Cement Co. will install automatic packing machine costing \$45,000;

pack cement bags and deliver to cars; has let contract.

COTTON COMPRESSES AND GINS

Ala., Forest Home.—Stables.—Lazenby Mill Co., capital \$3600, incpd. by A. V. Stables, R. A. Wall and others; will operate cotton gin, sawmill, grist mill, etc.

Ark., Moro.—Farmers' Gin & Seed Co., capital stock \$10,000, incpd.; D. H. Smith, Prest.; R. K. James, V-P.; E. H. Echols, Secy.; J. Miller, Treas.

Fla., Gainesville.—Mrs. Lois Tucker will establish cotton gin; has purchased machinery.

Miss., Boyle.—S. C. Gaylor will construct cotton gin; Murray system; 75 bales daily capacity; fireproof construction; cost \$20,000.

N. C., Grover.—Grover Gin Co., authorized capital \$5000, incpd. by J. L. Green and others.

COTTONSEED-OIL MILLS

N. C., Clayton.—Clayton Cotton Oil Mills, E. L. Hinton, Prest., increased capital stock from \$40,000 to \$80,000.

Tex., Celina.—Farmers' Cotton Oil Co. increased capital stock from \$32,000 to \$42,000.

DRAINAGE SYSTEMS

Fla., Elkton.—St. John County Comms., St. Augustine, Fla., engaged Peter Kendrick, St. Augustine, to obtain data and prepare maps, estimates, etc., for Elkton Drainage Dist.; proposes to drain 5000 acres for farm development.

Tenn., Selmer.—McNairy County Comms. to organize Big Owl Creek Drainage Dist.; David A. Hill, Civil Engr., made surveys providing for canal 5.75 mi. long, 21 ft. wide at top, 13 ft. wide at bottom and 8 ft. deep; approximate excavation, 181,573 cu. yds.; survey covered 2151 acres; Abernathy & Abernathy of Selmer and Harry M. Rhine of Booneville, Miss., are attorneys for petitioners.

Tex., Richmond.—Fort Bend County Drainage Dist. No. 1 will improve drainage system; bids until Sept. 12; Clifton Rice, Civil Engr., Richmond; B. A. Everts, Chmn. Drainage Comms., Clodine, Tex. (See Machinery Wanted.)

ELECTRIC PLANTS

Ark., Argenta.—City is reported as to issue bonds to install ornamental street-lighting system. Address The Mayor.

Ark., Gurdan.—City proposes to construct electric-light plant; report says Albert C. Moore, Engr., Joplin, Mo., has been engaged to prepare plans and specifications.

Ark., Malvern.—Arkansas Power Co. is reported as contemplating improvements costing \$40,000.

Ark., Marshall.—City granted franchise A. B. & V. B. Johnson, Mgrs. Marshall Milling Co., to install electric-light plant. (Lately noted.)

Fla., Clearwater.—City defeated proposition granting franchise to C. H. Evans and others to build electric-light and power plant. (Lately noted.)

Fla., Fort Meade.—City voted \$25,000 bonds for electric-light plant; M. A. Wilson, Mayor. (Lately noted.)

Fla., Homestead.—City proposes to ask Legislature for permission to issue \$50,000 bonds to construct electric-light plant, water-works and streets. Address The Mayor.

Fla., Macclenny.—City will vote on bonds to install electric-light plant and water-works. Address The Mayor.

Fla., Pablo Beach.—City votes Sept. 15 on \$10,000 bonds to construct electric-light plant. Address The Mayor. (Lately noted.)

Fla., Zolfo.—Zolfo Electric Co., H. G. Murphy, Prest., let contract Fitz-Williams to build power-house for electric-light plant; also purchased 50 H. P. engine and other equipment; 1000 lights capacity. (Lately noted.)

Ga., Crawfordville.—J. A. Ingram of Modern Equipment Co. submitted to City Coun-

In writing to parties mentioned in this department, it will be of advantage to all concerned if the Manufacturers Record is mentioned.

ell proposition to install electric-light plant costing \$4000.

Ky., Henderson.—City will construct 90x70 ft. boiler-room; steel frame; brick walls; steel window frames; reinforced concrete on roof; concrete foundations; composition roof; bids invited; plans and specifications obtainable from L. P. Hite, Supt. (Lately reported to rebuild portion of electric-light plant.)

La., Abita Springs.—City let contract Aubert & Rauch for lighting streets with electricity; they will install plant to include 2200-volt A. C. generator, 5 K. V. A. transformer, 20,000 ft. wire for overhead distribution, etc. (Lately noted.)

La., Pineville.—State Board, Baton Rouge, proposes construction power plant for State Insane Asylum; having plans prepared by Favrot & Livaudais, New Orleans.

Miss., Maben.—City is reported to have let franchise F. H. Mudd to install electric-light plant.

Mo., Armstrong.—City, Chas. A. Kraus, Mayor, let contract Frank H. Wheeler, Omaha, Neb., to construct 9-mi. transmission line, cost \$7000, for electric-light system; Tuttle & Pike, Engrs., Kansas City, Mo.

N. C., Hazlewood.—Town will issue \$15,000 light, water and sewer bonds. J. B. Hoyle, Town Clerk.

N. C., Saluda.—City sold \$10,000 light, water and sewer bonds. Address The Mayor.

N. C., Winton.—Town let contract to J. W. Smith Electric Co., Winton, to install electric-light plant; steam power; at present will use 37½ K. W., 2300 volts, 60 cycles; later, town will develop nearby water-power and enlarge plant. (Lately noted.)

S. C., Branchville.—City votes Sept. 22 on \$10,000 electric-light plant bonds. Address The Mayor.

Tenn., Friendship.—Business Men's League, D. A. Walker, Pres., interested in securing construction electric-light plant and water-works.

Tex., George West, (not a P. O.).—George West receives bids until Sept. 10 at office of Bartlett & Ranney, Inc., Consult. Engrs., San Antonio, Tex., to construct electric-light plant, etc., lately noted. (See Water-works and Machinery Wanted.)

Tex., Marble Falls.—City votes Sept. 5 on bonds for electric-light system, etc. Address The Mayor. (See Water-works.)

Va., Richlands.—Richlands Service Corp. will construct electric plant and transmission system to furnish electricity to Richlands, Cedar Bluff, Raven and coal-mining companies on Big and Coal creeks.

Va., Whittles.—Southern Ry. Co., B. Herman, Ch. Engr., Washington, D. C., let contract I. C. Abbott, Brandy, Va., to construct generator-house in connection with installation automatic signals between Archer and Whittles.

FERTILIZER FACTORIES

Mo., St. Louis.—Blood and Bone Fertilizer Co. Incptd. by Irving I. Mayer, Herman S. Wolfheim and Julian Mayer.

S. C., Charleston.—American Agricultural Chemical Co. (main office, 2 Rector St., New York) will erect 2 buildings; 223x360 ft. and 223x340 ft.; frame and concrete; tar and gravel roof; A. H. Nickerson, Chief Engr., 92 State St., Boston, Mass.; construction progressing; all material, including machinery, etc., has been purchased; general contract lately noted let to Huggler Bros., 723 Bell Bldg., Montgomery, Ala.

Va., Norfolk.—Baugh & Sons Co., Calvert and Water Sts., Baltimore, Md., is constructing storage shed adjoining plant; view to increasing works in near future. (Previously noted.)

FLOUR, FEED AND MEAL MILLS

Ala., Forest Home.—Stables-Lazenby Mill Co., capital \$3600, incptd. by A. V. Stables, R. A. Wall and others; will operate grist mill, cotton gin, sawmill, etc.

Ark., Arkadelphia.—Arkadelphia Milling Co. will erect annex to flour mill to increase daily capacity from 1000 to 1400 bbls.; 3 stories; reinforced concrete; cost \$20,000.

Va., Graham.—Eclipse Roller Mills Co., capital stock \$50,000, chartered; Pres., W. H. Thomas, Branwell, W. Va.; Secy.-Treas., Newton T. Roberts, Crystal, W. Va.; Gen. Mgr., G. I. Sipe, Graham.

FOUNDRY AND MACHINE PLANTS

Ala., Birmingham.—Hay Presses.—C. W. Drake & Bro. plan to mfr. patented hay press; now equipping plant.

Ala., Huntsville.—Machine Works.—Hutchins & Murdock will erect 2-story brick build-

ing; 2d floor to be occupied by Mitchell & Bryant Machine Works and 1st floor by Mitchell Garage.

Ga., Ashburn.—Railway Switches.—Potts-Wilson Frogless Switch Co., authorized capital \$100,000, incptd. by L. L. Potts and Leonard B. Wilson.

Ky., Louisville.—Stoves.—Graf Stove & Range Co. increased capital stock from \$100,000 to \$110,000.

Mo., St. Louis.—Engines.—Groover Engine Co. incptd. by Geo. L. Middleton, Fred W. Morgan and others of St. Louis and John C. Porter of Northampton, Mass.

N. C., Laurinburg.—Plows.—Herndon Plow Co. (lately noted chartered, authorized capital \$10,000) organized; F. C. McCormick, Pres.; W. T. Herndon, V.-P.; Archie K. Currie, Secy.-Treas.; building plans undecided; desires correspondence with manufacturers of plows and parts. (See Machinery Wanted.)

N. C., Raleigh.—Foundry.—Raleigh Iron Works will build foundry, replacing present foundry; 50 per cent. daily capacity.

GAS AND OIL ENTERPRISES

Okla., Ardmore.—Scivally Petroleum Co., capital \$60,000, incptd. by Robt. F. Scivally and W. T. Whittington of Ardmore and R. F. Clay of Enid, Okla.

Okla., Newkirk.—Lathrop Oil & Gas Co., capital \$12,000, incptd. by Henry Mendius of Newkirk, Thos. G. Klepper and John B. Scott of Lathrop, Mo.

Okla., Tulsa.—Corbin Oil & Gas Co., capital \$8000, incptd. by G. N. Wright, T. A. Hever and W. A. Brownelle.

Okla., Wagoner.—Palo Oil & Gas Co., capital \$10,000, incptd. by J. C. Matteson of Wagoner, Ed Sewell and T. Q. Martin of Dallas.

PROPOSAL ADVERTISEMENTS IN THIS ISSUE

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Okla., Wagoner.—Palo Oil & Gas Co., capital stock \$10,000, incptd. by Ed. Sewell, T. Q. Martin, both of Dallas, Tex., and J. C. Matteson, Wagoner.

Tex., Fort Worth.—Magnolia Petroleum Co., Box 1667, Dallas, Tex., received 25-year franchise to lay mains and pipe fuel oil under city streets. (City lately noted to vote on granting franchise.)

Tex., Jacksboro.—Oil Refinery.—Avis-Wood Oil & Coal Refining Co. is reported to establish oil refinery at oil wells.

ICE AND COLD-STORAGE PLANTS

Fla., Clearwater.—Clearwater Ice Co. will construct 25-ton daily ice plant, replacing 12-ton plant; let contract Parish & Goins, Tampa, Fla., to erect brick building costing about \$5000; upon completion this structure will extend building at cost about \$15,000 to cover company's electric-light plant.

N. C., Greensboro.—Arctic Ice & Coal Co. will erect 50x100-ft. addition to plant for ice storage, besides engine and boiler rooms; fireproof; construction by owner; install 50-ton ice machine; machinery and supplies (except power plant) purchased; also plans to install additional tankage at High Point, N. C., increasing daily capacity 20 tons. (Lately noted.)

N. C., High Point.—Arctic Ice & Coal Co. will install additional tankage, increasing capacity 20 tons; machinery purchased. (See N. C., Greensboro.)

Tex., San Benito.—Roy Campbell, San Antonio, is having plans and specifications prepared for construction refrigeration plant; capacity 8 carloads; machinery to include 32 H. P. electric motor furnishing power for refrigeration and for electric lighting and water pumping. (Lately reported as to cost \$10,000.)

Va., Newport News.—Yorktown Fish & Oyster Corp., Yorktown, Va., is reported as to install ice and cold-storage plant, etc. (See Canning and Packing Plants.)

IRRIGATION SYSTEMS

Tex., Donna.—La Blanca Agricultural Co., Beemer, Snyder & McDowell and others will organize irrigation district comprising 40,000 acres and issue \$800,000 bonds to acquire, reconstruct and extend present canal system.

IRON AND STEEL PLANTS

Mo., St. Louis.—Rolling Mills, etc.—St. Louis Screw Co., Clarence and Bulwer Aves., has begun construction rolling mills on 1¼-acre site at 6900 N. Broadway, extending to terminal tracks; erect steel-construction buildings 396x80 ft., 216x140 ft. and 210x80 ft., with 106x34-ft. coal pulverizer and 40x30-ft. transformer buildings; arranged for future additions; floor levels 4 ft. higher than yard level to facilitate loading cars; following construction of mill buildings, will erect bolt and nut plant, screw plant, general warehouse and office buildings; obtain electric power from Union Electric Light & Power Co.; receive electricity at 13,200 volts and transform, as required, to 2300, 440 and 220 volts; operate 600 H. P. mill motors at 2300 and smaller motors at 440 volts; motor-generator set for D. C.; equipment to include coal crushing and pulverizing plant of 8 tons capacity hourly and complete system cranes and monorail hoists; concentrate entire plant at new location upon sale or lease of present plant; mfrs. screws, bolts, etc.; will add manufacture of bar iron and steel. (Previously mentioned.)

LAND DEVELOPMENTS

Ala., Toinette.—Toinette Stock & Fruit Farms Co., capital \$7000, incptd. by H. W. Cochran and others.

Fla., Espiritu Santo Springs, P. O. Safety Harbor.—Espiritu Santo Springs Co. (lately noted incptd., capital stock \$300,000) will re-

Ga., Allenhurst.—Dunlevy Lumber Co. will install additional machinery.

Ga., Lanier.—W. G. Tuten is reported as to rebuild sawmill lately destroyed by explosion.

Ky., Falmouth.—Falmouth Lumber & Coal Co., capital \$4500, incptd. by H. C. Clark, M. V. Holday and T. C. Bradford.

Ky., Manchester.—C. B. Lytle and Cecil B. Donnelly, Manchester, sold 40,000 acres coal and timber land to Scranton (Pa.) capitalists for development.

La., Shreveport.—Webster Sawmill Co., capital \$25,000, incptd.; T. E. Stephenson, Pres.; A. D. Turner, V.-P.; J. A. Stephenson, Secy.

N. C., Pisgah Forest.—Carr Lumber Co. is reported as to add unit of 50,000 ft. daily capacity to present mill of that capacity.

Okla., Idabel.—Home Builders' Lumber Co., capital stock \$250,000, incptd. by A. J. Waldock, W. H. Thompson and J. F. Humphries.

S. C., Georgetown.—Winyah Lumber Co. will rebuild mill reported burned at loss of \$100,000.

Va., Norfolk.—Virginia Lumber Corp., capital stock \$50,000, chartered; E. W. Spink, Pres.; C. L. Clark, V.-P.; R. H. Burrough, Secy.-Treas.

Va., Richmond.—S. & W. H. Northrop changed name to Richmond Lumber Co. and increased capital stock from \$25,000 to \$50,000.

W. Va., Elkins.—Wearns Lumber Co. purchased timber land on Stittingtons Creek in Pocahontas county; will erect double band sawmill.

METAL-WORKING PLANTS

Ala., Talladega.—Roofing, etc.—Talladega Sheet Metal & Roofing Co. incptd. by R. J. Barry, F. M. Dooley and W. B. Harrison.

W. Va., Westmoreland (not a postoffice).—Enamelled Steel Signs, etc.—Ohio Valley Enameling Co., capital \$25,000, incptd. by L. H. Cammack of Huntington, J. R. Burt, P. E. Burt, M. J. Burt and A. M. Burt of West Lafayette, O.

MINING

Ark., Fayetteville.—Guano, etc.—Northwestern Mining & Fertilizer Co. organized; \$4000 capital; A. H. Markle, Pres.; Dan Coleman, V.-P.; Frank M. Kennedy, Secy.; Tom Kennedy, Treas.; is developing about 20,000 acres in Carroll, Marion, Newton, Madison and Washington counties containing nitrate and chloride of potash and guano; ready to ship carload lots of 20 tons each. (Tom and Frank Kennedy, Stuttgart, Ark., lately noted as having purchased 60-acre guano deposit.)

Ark., Pike County.—Tripoli.—W. C. Ross Mtg. Co., 1705 E. 9th St., Little Rock, will make lately-noted tripoli development; acreage 40 to 200; contemplates establishment of mills and mining machinery, 30 to 50 tons daily capacity, within next few months; W. C. Ross, Pres.; L. K. Snodgrass, V.-P.; C. W. East, Secy., Treas. and Mgr.; want prices on machinery. (See Machinery, etc., Wanted.)

Mo., Roaring River (not a postoffice).—Quarries.—Bruner Realty & Investment Co., Commerce Bldg., Kansas City, Mo., contemplates installing channeling machine and operating quarries; J. D. Halderman, Gen. Mgr. quarries, address Springfield, Mo. (See Land Developments.)

MISCELLANEOUS CONSTRUCTION

Fla., Espiritu Santo Springs, P. O. Safety Harbor.—Espiritu Santo Springs Co., W. E. Sinclair, V.-P. and Gen. Mgr., will build seawall and construct sidewalks at cost of about \$50,000; probably consider bids in about 60 to 90 days; desire inquiries; plans simple; no engineer yet employed.

Fla., Jacksonville.—Dock.—Atlantic Coast Line R. R. Co. progressing with dock under construction on St. Johns River; dock to be 100x400 ft.; about 1200 piles; cost about \$20,000; M. F. Cahill, 1641 Market St., Jacksonville, is contractor for material and construction.

Fla., Jacksonville.—Municipal Docks, Terminals, etc.—Port Commrs., Montgomery Corse, Chrmn., and F. W. Bruce, Ch. Engr., adopted report providing for docks nearly double length originally planned; new plans to provide for 2 piers, each 1000 ft. long, 260 ft. wide; \$1,500,000 available and further expenditure contemplated. (Lately completely outlined.)

Ga., Savannah.—Steamship Terminals.—Ocean Steamship Co., Wm. H. Pleasants, Gen. Mgr., Pier 35, North River, New York, let terminals contract, as lately stated, to Phoenix Construction Co., 41 Park Row,

New York; reinforced concrete structure supported on yellow-pine piles; work covers about 8500 piles and 20,000 yds. reinforced concrete; contractor is letting contracts for various materials; Ch. Engr., J. G. Basinger, 52 Broadway, New York. (Recently mentioned with other details; total expenditure reported to be about \$300,000.)

Ky., Louisville—Boiler-house.—St. Louis Bertrand Church will erect brick boiler-house at 6th and Catherine Sts.; cost \$3000.

N. C., Washington—Water Terminal.—City engaged John H. Bernhard, Mgr. Inland Navigation Bureau, New Orleans, La., to plan proposed municipal terminal; proposes to construct docks, tracks, etc.; recently voted \$30,000 bonds to purchase site. Address The Mayor.

Okla., Goodwell—Heating System.—Oklahoma State Board of Agriculture, Oklahoma City, will extend and improve heating and plumbing systems at Panhandle Agricultural Institute; bids until Oct. 1. (See Machinery Wanted.)

Okla., Tulsa—Mausoleum.—Cemetery Board (Randolph Shirk) will build mausoleum; Carthage stone and reinforced concrete; capacity 400 crypts; cost about \$25,000; plans and specifications prepared.

S. C., Charleston—Coal Pier.—Southern Ry. Co., B. Herman, Ch. Engr., Washington, D. C., let contract for construction coal-dock facilities enabling Southern Ry. and Virginian & Southwestern Ry. to handle Southern coal through Charleston; purchased large quantity material and will begin construction in about 2 weeks; location, site of 120 acres, with about 4000 ft. waterfront, on Cooper River; let contract Wellman-Seaver-Morgan Co., Cleveland, O., to construct coal-handling machinery; plant designed to deliver coal to vessels at rate 2000 tons hourly; will now construct single unit and add others as needed; equipment to include standard-gauge railway 5000 ft. long; coal-loading tower to consist of structural-steel framework supporting coaling boom, etc.; at rear side of tower will be tilting hopper, etc. (Lately noted.)

Tenn., Memphis—Levee.—Board of Commissioners, C. C. Pashby, City Clerk, asks bids until Sept. 2 to construct concrete walls for North Memphis levee; about 1500 cu. yds. No. 1 reinforced gravel concrete for counterfort type wall, and 250 cu. yds. same for core type wall; 250 cu. yds. excavation, or alternative proposal of stone concrete; steel already purchased, and will be supplied to contractors on price; levee and pumping station lately noted. (See Machinery Wanted.)

Tenn., Memphis—Mausoleum.—T. H. Tutwiler, G. T. Fitzhugh and H. P. Johnson, committee, accepted plans and specifications for construction mausoleum in Forest Hill Cemetery; 160x75 ft.; concrete, stone, marble and bronze; interior walls and floors of white marble; 528 crypts; 14 tombs; 40x23 ft. chapel; cost \$100,000; Archt., C. O. Pfeil, Memphis; contract for concrete work let to C. R. Miller & Co. and for stone work to Toomey & Brisben, both firms of Memphis.

Tex., Houston.—City decided to vote upon issuing bonds (lately noted recommended by Municipal Harbor Board) to construct wharves, slips, warehouses, power plant, etc., at turning-basin; will vote on \$5,000,000 bonds, \$3,000,000 to be for turning-basin, wharves and terminals, while \$2,000,000 will be for sanitary and sewer improvements; now having plans and specifications prepared for construction pier, with slips and warehouses on ship channel below turning basin; first wharves to have frontage of 1000 ft.; use creosoted timber; E. E. Sands, City Engr. (Recently mentioned.)

Tex., Rockdale—Levee.—Milam County Improvement Dist., John Hicks, Mgr., will construct dirt levee on Little River; 61,067.24 cu. yds.; 5.3 mi. long; plans and specifications on file; bids until Sept. 25. (See Machinery Wanted.)

W. Va., Charleston—Retaining Wall.—City, J. F. Bedell, Prest. Board of Affairs, will construct concrete retaining wall along levee; about 7400 lin. ft. piling and 2200 cu. yds. concrete masonry; bids until Sept. 10; G. S. Brown, City Engr., Leewenstein Bldg., Charleston. (See Machinery Wanted.)

MISCELLANEOUS ENTERPRISES

Ala., Ashville—Dairy.—Ashville Dairy & Stock Co., capital \$4450, inceptd. by J. P. Montgomery and others.

Ala., Birmingham—Blueprinting.—Tredinnick-Duncan Blueprint Co., capital stock \$4000, inceptd. by W. W. Tredinnick, Prest.; Robt. G. Thach, V.-P.; J. H. Duncan, Secy.-Treas.

Ark., Sheridan—Publishing.—Grant County Progress, D. E. Waddell, Mgr., will be es-

tablished; install power press and job-printing equipment; cost \$2250.

Fla., West Palm Beach—Laundry, etc.—West Palm Beach Laundry & Cleaning Co. will enlarge plant.

Ga., Savannah—Dry Cleaning.—May Dry Cleaning Co., capital \$15,000, inceptd. by J. S. Banks, V. W. Lebey, R. T. Waller, Jr., and others.

Ky., Ashland—Construction.—Union Construction Co., capital \$3000, inceptd. by W. P. Wheeler, D. H. Putman and Oliver Van Petton.

Ky., Louisville—Window Cleaning.—City Window Cleaning Co. inceptd. by Joseph Goldhagen, Isador Ackerman and Abe Lewis.

Ky., Louisville.—Missouri Parlay Co. inceptd. by B. B. Bates, Inter-Southern Bldg., and others.

Md., Baltimore—Contracting.—Chas. L. Stockhausen Co., capital stock \$75,000, chartered by Chas. L. Stockhausen, Marine National Bank Bldg.; Pohn T. Frantz, August C. Weber and Chas. Handler; continue contracting business of Chas. L. Stockhausen.

Mo., St. Louis—Construction.—Boeke Construction Co., capital stock \$6000, inceptd. by Johanna Boeke, Anna Boeke, Fred Boeke and others.

Tenn., Memphis—Lumber Curing.—Sullivan's New Process, capital stock \$100,000, incorporated by John P. Sullivan, K. B. Sullivan, A. B. Nolan and others; to commercialize process to cure lumber, logs and timber.

Tex., Beaumont—Dairy.—Ideal Producing Dairy Co., capital stock \$100,000, organized to establish dairy; will build sanitary stables, milking sheds, silos, etc.

Tex., Dallas—Cleaning and Dyeing.—Kennedy Cleaning & Dyeing Co., capital stock \$20,000, inceptd. by W. E. Kennedy, R. W. Rigdon and Oscar Tomerlin.

Tex., Houston—Construction.—McKee Construction Co., capital stock \$25,000, inceptd. by Chas. F. McKee, Robt. E. Goree and H. S. Fox, Jr.

Tex., Kaufman—Laundry.—Kaufman Steam Laundry, capital stock \$6000, inceptd. by C. S. Smith, W. J. Beck and W. R. Evans.

Tex., Marble Falls—Garbage Disposal Plant. City votes Sept. 5 on bonds for garbage disposal plant, etc. Address The Mayor. (See Water-works.)

Tex., Texas City—Contracting, etc.—Longshoremen's Contracting & Stevedoring Corp., capital stock \$5000, chartered by W. L. Palmer, L. R. Simmons and J. H. Hardy.

Va., Bedford City—Railroad Contracting.—J. J. Boxley, Son & Co., capital \$50,000, incorporated; R. F. Boxley, Prest., Roanoke; S. D. Tallafiero, V.-P., Salem, Va.; R. H. Waddell, Secy., Charlottesville, Va.

Va., Bristol—Hardware, etc.—Bristol Hardware Corp., W. J. Fickle, Prest., organized to take over Bristol Hardware Co.; deals in hardware, agricultural implements, vehicles, paints, etc. (Lately noted inceptd., \$50,000 capital.)

Va., Wise—Publishing.—Wise Virginian Publishing Co., capital \$2500, inceptd.; N. F. Hix, Prest.; J. E. Pearce, Secy.

W. Va., Philippi—Publishing.—Philippi Publishing Co., capital stock \$5000, inceptd. by S. F. Huffman, J. R. Weekley, W. E. Swan and others.

W. Va., Welch—Engineering.—Pocahontas Engineering & Construction Co., capital \$25,000, inceptd. by A. C. Hufford, Sam C. Walker, J. N. Harman, Jr., and others.

MISCELLANEOUS FACTORIES

Ala., Birmingham—Beverage.—Nifty-Cola Co., capital stock \$5000, inceptd. by J. D. Evans, H. W. Beles and J. Joseph.

Ala., Sheffield—Bottling.—Sheffield Chero-Cola Bottling Works (lately noted as "Adams Bros."), office address until Jan. 1, Richland, Ga., will open proposals Nov. 1 to erect 70x100-ft. mill-construction building; cost about \$1200; install complete plant, including crates, bottles, trucks, etc., cost \$8000 to \$9000, to mfr. carbonated beverages; daily capacity, 400 to 500 doz. Address Adams Bros., Richland, Ga.

D. C., Washington—Bottling.—Arlington Bottling Co. has plans by Oscar Vogt, 405 Corcoran Bldg., Washington, for bottling plant; fireproof; cost of building \$30,000; bids opened Aug. 28. (Lately noted.)

Fla., Auburndale—Fruit Syrup.—Chas. E. Langley and others will organize company to build plant with daily capacity 500 gals. fruit syrup and 5000 cans preserved grapefruit.

Fla., Miami—Bakery, Ice-cream, etc.—John Seybold, 321 12th St., previously noted as

letting contract to St. John Construction Co. to erect 3-story 50x120-ft. concrete building, will expend \$60,000 to \$75,000 on building and fixtures; lower floor for retail bakery and confectionery, ice-cream parlors, etc.; two upper floors, offices; building to be ready by Oct. 15; Mr. Seybold also contemplates constructing a bakery and ice-cream factory, probably within one or two years.

Fla., Tampa—Cigars, etc.—Quiros, Villazon y Ca., capital stock \$100,000, inceptd.; Jose Villazon, Prest.-Treas.; F. A. Rian, 1st V.-P.; Francisco Fernandez Busto, 2d V.-P.; R. M. Cabarrouty, Secy.

Ga., Albany—Ice Cream and Potato Chips.—Peter L. McDonough, 112 Jackson St., contemplates establishing ice-cream factory; also Irish potato-chip factory. (See Machinery Wanted.)

Ga., Macon—Beverages.—Macon Chero-Cola Co., capital stock \$100,000, inceptd. by F. E. Land, J. J. Willis and E. J. Johnston.

Ky., Georgetown—Ice-cream.—Sanitary Ice-Cream Co., capital \$1700, inceptd. by Geo. H. Allen, O. T. Golden, D. L. Perry, L. E. Downs and others.

Ky., Louisville—Ornamental Glass.—Blum Ornamental Glass Co., capital \$10,000, inceptd. by W. F. Blum, H. B. Ohlenroth and E. W. Birry.

Ky., Louisville—Feed-water Regulators.—Ray Mfg. Co., capital stock \$20,000, inceptd. to mfr. continuous feed-water regulator invented by Fredk. L. Ray, Prest. of this company and superintendent motive power Louisville Ry. Co.

Ky., Louisville—Computers.—United States Utilities Co., capital stock \$60,000, inceptd. by R. F. Wortham and Wm. G. Cosgrove of Louisville and J. M. Bradley of Middletown, Ky.

Ky., Louisville—Tobacco.—Axton Fisher Tobacco Co. let contract to Geo. A. Skilton, 20th and Arbogast Sts., Louisville, to erect tobacco plant; factory building 60x120 ft.; 5 stories; power-house 60x50 ft., one story; storage warehouse 62x185 ft., one story; fireproof; Val P. Collins, Archt., 624 Paul Jones Bldg., Louisville; install 2 boilers, 100 H. P.; deep-well pump; Corliss engine; electric generator and motors for power. (Factory lately noted to cost \$25,000.)

Miss., Jackson—Drugs, etc.—Southern Spice & Extract Co., capital stock \$10,000, organized by W. A. Montgomery, R. C. Smith, C. Wade Phillips and others; will establish drug, spice and extract plant in John Hart Bldg.; C. W. Phillips, Mgr.

Miss., Yazoo City—Paper Pulp.—Economic Power & Products Co., Lafayette Bldg., Philadelphia, Pa. (lately noted organized to mfr. paper pulp and by-products from cotton stalks), contemplates plant of 50 tons daily capacity; upon location of site will determine cost, dimensions and character of buildings; James N. Dyson, Prest.; Jas. B. Coryell, 1st V.-P.; Elbert A. Corbin, 2d V.-P.; Wm. D. Miller, Secy.-Treas.; M. W. Marsden, Engr.; capital stock \$2,500,000 preferred and \$7,500,000 common.

Mo., Brookfield—Creamery.—Brookfield Creamery Co., capital \$8000, inceptd. by I. V. Powers, W. T. Ridgeway and C. C. Baker.

Mo., Joplin—Powder.—Diamond Powder Co., capital \$40,000, inceptd. by W. W. Chambers, C. G. Gilman and Owen C. Grover.

Mo., Kansas City—Priest Mfg. Co., capital \$2000, inceptd. by M. H. Maynard, A. M. Peck and A. H. Heaton.

Mo., Kansas City—Burdett Mfg. Co., capital \$75,000, inceptd. by M. C. Tomlinson, C. S. Van Noy and J. T. M. Johnston.

Mo., St. Joseph—Biscuits.—Independence Biscuit Co., H. W. Fix, Prest., Independence, Kans., will establish plant; engaged Trunk & Gordon to prepare plans for building; 125x60 ft., fireproof, 2 stories and basement; will increase capital stock from \$50,000 to \$100,000.

Mo., St. Louis—Chocolate Specialties.—Lehelde Mfg. Co. increased capital from \$30,000 to \$50,000.

Mo., St. Louis—Burchwell Mfg. Co., capital stock \$10,000, inceptd. by A. H. Burchard, L. H. Ferrell and W. M. White.

Mo., St. Louis—Novelties.—Mechanical Novelty & Mfg. Co. increased capital stock from \$5000 to \$20,000.

Mo., St. Louis—Thermometers.—American Thermometer Co., capital stock \$100,000, inceptd. by Chas. D. Bolln, Chas. Welsenfels and Paul U. Farley.

N. C., Charlotte—Bakery.—Hygiene Bakery Co., authorized capital \$10,000, inceptd. by A. L. Milliron, R. A. Milliron, R. K. Gilbert and others.

Okla., Grove—Incubators.—Faultless Incubator Co., capital stock \$5000, inceptd. by Al-

bert Sulwold, Henry F. Dixon and John T. Oakley.

S. C., Columbia—Marble.—South Carolina Marble Works, capital stock \$5000, inceptd. by F. H. Hyatt and F. H. Hyatt, Jr.

Tenn., Memphis—Wood Chemicals.—W. H. Matthews, Detroit, Mich., is reported to have purchased Forest Products Co.'s plant; will increase capital stock from \$60,000 to \$125,000 and provide additional railroad facilities.

Tex., Dallas—Films.—World Film Corp., capital stock \$5000, inceptd. by Fount Ray, J. C. Thompson and C. L. Cox.

W. Va., Huntington—Glass Bricks.—Glass Brick Co., capital stock \$600,000, inceptd.; build plant to mfr. glass bricks; Chas. B. Lawton, Prest., Ricketts Bldg. (Lately noted.)

W. Va., Moundsville—Whips.—J. C. Bardall Broom Co. will remodel building and install machinery to mfr. whips and other leather goods; will operate as H. Brown Whip Co.

W. Va., Wheeling—Paint.—Blue Ribbon Paint Co. organized with Norbert Brucke, Prest., Pittsburgh, Pa.; E. C. Butler, Treas., Cleveland, O.; Wm. Vought, Supt., Wheeling; leased 4-story building on S. Main St.; will remodel and equip to mfr. paint.

W. Va., Wheeling—Photographic Printing Machines.—Model Mfg. & Electric Co., David Pittsley, Prest., 1116 Market St., will operate plant to mfr. electric photographic printing machines, switches and other novelties; contemplates erecting building; plans not determined. (Lately noted inceptd., \$25,000 capital.)

MOTORS AND GARAGES

Ala., Huntsville—Garage.—Hutchins & Murdock will erect 2-story building; first floor to be occupied by Mitchell Garage.

D. C., Washington—Garage.—W. S. Plager, 210 N. Capitol Ave., prepared tentative plans for 2-story garage at 24th and M Sts. N. W.; brick and reinforced concrete; cost \$60,000.

La., Lake Charles—Garage.—Bolen Garage Co. leased Reinaur Bldg. and will establish garage; install machinery for repairs.

Miss., Meridian—Garage.—Mrs. W. S. Smith will build lately-noted 80x125-ft. garage, to be occupied by Threefoot Bros. & Co., who will build their own garage next year; install machinery for car repairs in building erected by Mrs. Smith.

Mo., Kansas City—Automobiles.—Kansas City Auburn Auto Co., capital \$8000, inceptd. by R. W. Gall, B. P. Gall and E. H. Farnsley.

N. C., Concord—Garage.—Cabarrus Motor Co. let contract to R. A. Brown Construction Co., Concord, to erect 112x61-ft. one-story garage; cost \$5500.

Tenn., Memphis—Automobile Works.—Maxwell Motor Co., Detroit, Mich., states it will not establish branch works lately noted, report being erroneous; has established repair parts and automobile station to meet local demand. (Recently mentioned.)

Tenn., Savannah—Automobiles.—Savannah Motor Car Co., capital stock \$5000, inceptd. by H. E. Williams, Arch. Walker, W. E. Ross and others.

Tex., Tahoka—Garage.—Daniels & Fielder will build garage and repair shop; 125x60 ft.

W. Va., Weston—Garage.—W. C. Weber and B. E. Wells will construct 100x50-ft. 2-story brick building costing \$10,000; first story for garage and second story for apartments.

RAILWAY SHOPS, TERMINALS, ROUNDHOUSES, ETC.

Ky., Lexington—Louisville & Nashville R. R., W. H. Courtenay, Ch. Engr., Louisville, let contract Rommel Bros., Louisville, to erect roundhouse, shops, etc. (Lately noted.)

ROAD AND STREET WORK

Ala., Birmingham.—Jefferson County Board of Revenue contemplates construction of 2 mi. road connecting Lovie Rd. with Leeds and construction bridge across Cahaba River near Lovie.

Ala., Gadsden.—Etowah County Commrs. contemplete calling election on \$300,000 bonds for road construction.

Fla., Fort Meade.—City voted \$25,000 bonds to improve streets. M. A. Wilson, Mayor. (Lately noted.)

Fla., Homestead.—City proposes to ask Legislature for permission to issue \$50,000 bonds to construct streets, water-works and electric-light plant. Address The Mayor.

Fla., Marianna.—Jackson County Commrs., J. E. Gammon, Chrmn. of Board, will construct cement wall and walk around court-

house square; bids until Sept. 8. (See Machinery Wanted.)

Fla., Miami.—City let contract to Southern Asphalt & Construction Co., Birmingham, Ala., for laying 32,000 sq. yds. asphalt, and to F. G. Proudfoot, Chicago, Ill., for laying 22,000 sq. yds. asphalt; Engr., B. H. Klyce, 52 Real Estate Bldg., Miami. (Lately noted asking bids.)

Fla., Mt. Dora.—City will issue \$12,000 street-paving bonds. M. V. Simpson, Mayor. Ga., Albany.—Dougherty county defeated previously-noted bonds for road construction.

Fla., Pensacola.—Board of Comms. passed ordinance to pave Main St. between Palafox and Jefferson Sts. with wooden blocks.

Ga., Americus.—Sumter County Comms. recalled order for election to vote on issuing \$200,000 bonds for road improvement and bridge construction.

Ky., Greenup.—Greenup county will vote on \$300,000 bonds to improve roads. Address County Comms.

Ky., Louisville.—City will improve sidewalks on portions of 41st, Market, Preston and Rupp Sts., according to ordinances 236, 237, 238, 245 and 250 of series 1914; bids until Sept. 8; Harold G. McGrath, Secy. (See Machinery Wanted.)

Md., Baltimore.—Board of Awards let contract P. Reddington & Sons, 321 St. Paul St., Baltimore, at \$14,003.86 for vitrified brick paving as follows: Center St., from Mt. Vernon Pl. to Courtland; Courtland, from Franklin to Center, and St. Paul, from Hamilton to Center; let contract H. N. Brennan, Baltimore, at \$11,200, to improve grounds of Polytechnic Institute. (Lately noted.)

Md., Salisbury.—City will contract for 12,500 sq. yds. vitrified brick, bituminous concrete or bitulithic pavement on 5-in. concrete base; bids until Sept. 7; P. S. Shockley, Engr.; J. T. Parsons, City Clerk. (See Machinery Wanted.)

Miss., Bay St. Louis.—Hancock County Supvrs. ask bids until Sept. 7 on maintenance State and county roads; about 250 mi.; A. A. Kergosien, Clerk. (See Machinery Wanted.)

Miss., Corinth.—Alcorn County Comms. receive bids until Sept. 9 for constructing improved highways; Engr., Gus E. Hauser, Jr., Aberdeen, Miss. (See Machinery Wanted.)

Miss., Starkville.—Oktibbeha County Commissioners contemplate issuing road bonds for Supvrs. Dist. No. 1.

N. C., Hillsboro.—Orange County Good Roads Com., R. T. Brown, Engr., opens bids Sept. 14 to grade 5 mi. road; information at office of engineer. (See Machinery Wanted.)

N. C., Mooresville.—City, E. C. Deaton, City Clerk, has indefinitely postponed lately-noted 9000 yds. bituminous paving, concrete base and curb. (Bids previously noted for August 24.)

N. C., Raleigh.—City Com. decided to pave Newburn Ave. with asphalt from State Capitol to Soldiers' Home; Jas. I. Johnson, Mayor.

Okla., Tulsa.—City, E. B. Cline, Auditor, will pave portion of Norfolk Ave. and 3d St.; bids until Sept. 10. (See Machinery Wanted.)

Tenn., Crossville.—Cumberland county defeated \$75,000 bonds to construct roads; Geo. P. Burnett, County Judge. (Lately noted.)

Tenn., Dyersburg.—City let contract West Construction Co., Chattanooga, to pave 13 streets with asphalt; R. C. Huston & Co., Engrs., Memphis; L. E. Carne, Mayor. (Lately noted.)

Tenn., Huntingdon.—City let contract F. Ray Moomaw to macadamize 1 mi. street; cost \$5000; bids lately noted; now wants prices on pipe. (See Machinery Wanted.) (Lately noted asking bids.)

Tenn., Knoxville.—Knox County Road Com., Frank L. West, Clerk, let contract J. U. Burkhardt, Knoxville, at \$6020.05 for Rutledge Pike and at \$3357.50 for Emory Rd. improvements. (Lately noted.)

Tenn., Knoxville.—Knox County Road Com., Frank L. West, Clerk, let contract Dykes & Co., Knoxville, to macadamize Wrights Ferry Rd.; cost about \$2000.

Tenn., Pikeville.—Bledsoe County Comms. let contract Fruman & Robbins, Springfield, Tenn., for construction 40 mi. road costing about \$92,000; contract includes clearing, grubbing, excavation, masonry, concrete, pipe and bridges. (Lately noted asking bids.)

Tex., Aransas Pass.—City (lately noted voting \$8000 bonds for street improvement) will construct clay and shell streets with oil finish; let in sections at various times; Herbert West, City Engr.

Tex., Belton.—Comms. Road Dist. No. 7 of Bell County let contract A. M. Clopton at \$105,000 to construct 40 mi. 14 and 16-ft. gravel roads; Engrs., See & Smith, 211 Temple State Bank Bldg., Temple, Tex. (Call for bids lately noted.)

Tex., Caldwell.—City has \$20,000 available to construct gravel pavement, concrete curb and gutters; date of opening bids not determined; Browne & Wilder, Engrs., Houston, Tex. (Lately noted.)

Tex., Dallas.—City let contract W. D. Banks & Son to lay 13,600 sq. ft. concrete sidewalk and 8900 lin. ft. combination concrete curb and gutter in Fair Park; W. R. Tietze, Park Supt. (Lately noted.)

Tex., Fort Stockton.—Pecos County Commissioners contracts (lately noted let to following contractors) are as follows: Grading, complete, to Baker Mfg. Co., Sweetwater, Tex., at about \$47,500; concrete culvert and bridge contract to L. B. Westerman, Fort Stockton, at about \$24,000; work includes extensive culverts, small bridges and grading of dirt roads over about 230 mi.; completion within 6 mos.; Whiteaker & Washington, Engrs., 240 Moore Bldg., San Antonio, Tex.

Tex., Fort Worth.—Government opened bids for constructing roads, walks, gutters and drains; lowest bidders, Jennings & Woods, El Paso, Tex., at \$12,400. (Lately noted asking bids.)

Tex., Houston.—City let paving contracts, totaling \$18,150, as follows: Eureka Paving Co., Houston, Dallas St. from San Felipe to Bagby Sts., and Bagby St. from Dallas to Rusk Sts., and Walker St. from Louisiana to Milam Sts. with vertical fiber brick and asphalt filler; Texas Bitulithic Co., Dallas, Bagby St. from Anita to Baldwin Sts. with bitulithic. (Lately noted asking bids.)

Tex., Laredo.—City plans to issue \$8000 bonds for Jarvis Plaza paving. Address The Mayor.

Tex., Marble Falls.—City votes Sept. 5 on bonds to improve streets, etc. Address The Mayor. (See Water-works.)

Tex., Mt. Pleasant.—City has \$16,000 available for street improvement; no bids; J. F. Wilkinson, Mayor. (Bonds previously noted voted.)

Tex., Oakville.—Live Oak County Comms. recalled recent order for election on issuing \$100,000 road and bridge bonds. (Lately noted.)

Tex., Paris.—Lamar County Comms. will issue \$50,000 bonds for road improvements.

Tex., Rosenberg.—City let contract Hardin & Davis for recently-noted grading of business streets; contemplates paving.

Tex., San Antonio.—San Antonio Automobile Toll Road Co. will construct road to Medina Dam; macadam and crushed rock; estimated cost \$35,000.

Tex., San Marcos.—A. M. Clopton has contract at \$12,700 to build 6 1/2 mi. road in Kyle precinct, Hays county.

Tex., Sulphur Springs.—City has indefinitely postponed lately-noted paving; Arthur D. Stives, City Engr.

Tex., Texarkana.—City let contract Burton Hahn Construction Co., Dallas, to pave Maple and State Sts. with rock asphalt.

Va., Alexandria.—City will pave 2 squares on Lee St. from King to Queen St. with vitrified brick and construct granolithic sidewalks on each side; appropriated \$3800. Address The Mayor.

Va., Lawrenceville.—Brunswick County Comms. are considering petition from Alberta Dist. for vote on issuing \$100,000 road-improvement bonds.

Va., Fairfax.—Fairfax County Comms. contemplate calling election to vote on issuing \$80,000 bonds to improve about 30 mi. highway.

Va., Richmond.—City let contract Atlantic Bitulithic Co., Richmond, for asphaltic concrete paving on portions Ryland and Meadow Sts.; cost \$10,000. (Lately noted.)

Va., Richmond.—City will place granite curb on Ramp Rd. between Lester and Water Sts. and pave certain streets with granite spall paving; bids opened Sept. 1; Chas. E. Bolling, City Engr.

Va., Richmond.—City will grade and gravel certain streets, place granolithic curbing and guttering, lay granite spall paving, 113,000 sq. yds. smooth paving and 6000 sq. yds. granite block; bids until Sept. 15; Chas. E. Bolling, City Engr. (See Machinery Wanted.)

W. Va., Moundsville.—Marshall County Court let contract J. R. McFadden for paving Cameron-Clouston Rd., a distance of 1/2 mi., and to Berry & Hammond for grading and widening Reilly Hill Rd.

W. Va., Wheeling.—Ohio County Comms. let contracts Atlantic Bitulithic Co. of Rich-

mond, Va., to pave with Warnite 1 mi. National Rd. from 9th to 10th mileposts and from Rudler's Place to Leatherwood Lane; width of latter, 18 ft.; let contract Ball Engineering Co. of Wheeling to macadamize 23,000 yds. roadway on Cherry Hill, Wheeling and Elm Grove, and other roads; total, 53,000 sq. yds.; Geo. W. Oldham, Clerk. (Call for bids lately noted.)

SEWER CONSTRUCTION

Ark., Siloam Springs.—City will construct 12 mi. sewers. Address The Mayor.

D. C., Washington.—Dist. Comms., 509 Dist. Bldg., will construct 6250 lin. ft. pipe sewers, 12 in. to 24 in. diam.; bids until Sept. 8; information on application to Chief Clerk, 427 Dist. Bldg. (See Machinery Wanted.)

Fla., Fort Meade.—City voted \$7500 bonds to improve and extend sewer system and water-works. M. A. Wilson, Mayor. (Lately noted.)

Fla., Miami.—City let contract Southern Asphalt & Construction Co., Birmingham, Ala., for constructing sewers; Engr., B. H. Klyce, 52 Real Estate Bldg., Miami. (Lately noted voting \$90,000 bonds.)

Fla., Pablo Beach.—City votes Sept. 15 on \$25,000 bonds to construct sewer system. Address The Mayor. (Lately noted.)

Fla., Tampa.—City will construct sewers and appurtenances at De Soto Point, section 10, on Elmwood, Maple St. and Oakwood Ave., between 20th and 22d Sts.; about 1700 ft. 8-in. tile, with 66 "Y" branches, excavation less than 8 ft; 5 manholes less than 8 ft. deep; bids until Sept. 1; Allen Thomas, Clerk. (See Machinery Wanted.)

Ga., Louisville.—City voted \$12,000 bonds to extend sewer system and water-works; W. M. Crook, Const. Engr., Macon, Ga. (Lately noted.)

Ky., Ludlow.—City votes Nov. 3 on \$25,000 bonds to construct sewers. Address The Mayor.

Mo., Hannibal.—City's plans for sewers include 900 ft. 6x6-ft., 2000 ft. 4x6-ft., 700 ft. 3x4-ft. concrete culverts, 600 ft. 12-in. and 31,470 ft. 6-in. sewer pipes, 24 manholes, 15 lamp-holes, trenches from 4 ft. to 17 ft. deep; removal of 900 cu. yds. of rock; cost \$25,000; contract (lately noted) let to Frank L. Hall, Hannibal.

Mo., Higginsville.—City defeated bond issue, and has no present plans for lately-noted sewer construction.

N. C., Hazlewood.—Town will issue \$15,000 sewer, water and light bonds. J. B. Hoyle, Town Clerk.

N. C., Lillington.—City plans to issue \$25,000 sewer and water-works bonds. Address The Mayor.

N. C., Saluda.—City sold \$10,000 sewer, light and water bonds. Address The Mayor.

Tex., Laredo.—City plans to issue \$24,000 for storm-sewer construction. Address The Mayor.

Okla., Goodwell.—Oklahoma State Board of Agriculture, Oklahoma City, will extend sewer system at Panhandle Agricultural Institute; bids until Oct. 1. (See Machinery Wanted.)

Okla., Tulsa.—City will construct sanitary sewer system; bids until Sept. 10; T. C. Hughes, City Engr. (See Machinery Wanted.)

Tenn., Murfreesboro.—City contemplates voting on bonds to construct sewer system. G. B. Giltner, Mayor.

Tex., Anderson.—City engaged Browne & Wilder, Engrs., Houston, Tex., to prepare plans and specifications for complete sewer system; install septic tank and filter bed in connection with distribution system.

Tex., Dallas.—City will soon invite bids on contracts Nos. 1 and 4 (Oak Cliff trunk lines and Cedar Creek interceptors and overflow) in connection with proposed complete sewage-disposal system; contracts 1 and 4 to involve about \$150,000; contracts 2, 3, 5, 6 and 7 will be for trunk-line sewers, interceptors, disposal plant, pumping station, etc.; J. M. Preston, City Engr.; plans and specifications by Jas. H. Fuertes, 140 Nassau St., New York. (Previously noted; bonds for \$550,000, etc.)

Tex., Gatesville.—City contemplates voting on \$25,000 bonds to construct sewer system. Address The Mayor.

Tex., George West, not a P. O.—Geo. West receives bids until Sept. 10 at office of Bartlett & Ranney, Inc., Consult. Engrs., San Antonio, Tex., to construct sewer system, etc., lately noted. (See Water-works and Machinery Wanted.)

Tex., Houston.—City Council approved plans and specifications for constructing storm-water sewer on Orriene St. from Harrisburg Rd. to German St.; cost about

\$10,000; will invite bids; E. E. Sands, City Engr.

Tex., Waco.—McLennan County Comms. are considering organization of drainage district in East Waco to issue \$25,000 bonds for storm-water drainage system.

Va., Norfolk.—Board of Control will extend sewers in Seventh precinct; expenditure from balance of \$248,000 bond issue heretofore authorized; W. T. Brooke, City Engr.

Va., Richmond.—Administrative Board instructed Chas. E. Bolling, City Engr., to invite bids until Sept. 17 to construct sewer system, embracing territory about 1 sq. mi. in area; estimated cost \$40,000.

W. Va., Huntington.—Board of Comms. let contracts for First Ward trunk sewers, etc., as follows: No. 1, A. Keatley, \$7250; Nos. 2, 5 and 8, C. M. Scanlon, \$7984, \$2862.25 and \$951.87; Nos. 3, 4, 7, 10 and 11, Stender Construction Co., \$4607, \$2730.10, \$2060.50, \$1589 and \$733; Nos. 6 and 9, Sluss-Baker Co., \$3207.50. All of Huntington. (Lately noted asking bids.)

TELEPHONE SYSTEMS

N. C., Greensboro.—Southern Bell Telephone & Telegraph Co. (main office, Atlanta, Ga.) is reported to expend \$15,000 for improvements and extensions, including \$8000 for underground cables.

TEXTILE MILLS

Ark., Pine Bluff.—Cotton Goods.—Chamber of Commerce, E. B. Bloom, Secy., is negotiating with North Carolina manufacturer planning to establish \$60,000 cotton mill.

Ky., Fulton.—Rainproof Cloth.—Harrison Bros., care Union City Waterproofing Co., Union City, Tenn., have not decided on location for lately-reported mill to mfgr. waterproof cloth.

N. C., Forest City.—Hosiery, etc.—Wilkie-Tanner Mfg. Co., capital stock \$25,000, incorporated by C. A. Wilkie of Forest City, K. S. Tanner of Rutherfordton, N. C., and Morehead Jones of Charlotte; will build mill to knit hosiery and underwear.

Tenn., Fayetteville.—Cotton Duck.—Elk Cotton Mills will, it is reported, build No. 2 mill and install 10,000 spindles, 300 looms, etc.

Tenn., Loudon.—Hosiery.—Loudon Hosiery Mills will build 168x62-ft. addition; 1 story and basement; fireproof construction; cost \$15,000; Archt., H. L. Huntington, Chattanooga, Tenn.

WATER-POWER DEVELOPMENTS

N. C., Winton.—Town contemplates developing nearby water-power and enlarging plant; I. V. Turner, Town Clerk. (See Electric Plants.)

WATER-WORKS

Fla., Fort Meade.—City voted \$7500 bonds to improve and extend water-works and sewer system. M. A. Wilson, Mayor. (Lately noted.)

Fla., Homestead.—City proposes to ask Legislature for permission to issue \$50,000 bonds to construct water-works, electric-lighting plant and streets. Address The Mayor.

Fla., Macclenny.—City will vote on bonds to install water-works and electric-light plant. Address The Mayor.

Ga., Louisville.—City voted \$12,000 bonds to extend water-works and sewer system. W. M. Crook, Const. Engr., Macon, Ga. (Lately noted.)

Ky., Hodgenville.—City voted \$14,300 bonds to construct water-works. Address The Mayor. (Lately noted.)

Ky., Midway.—City considering installation water system. Address The Mayor.

Ky., Providence.—Providence Water & Utilities Co., authorized capital \$100,000, organized by W. E. Hunter and others; plan to construct water-works for 5000 population. (City lately noted as to grant water-works franchise.)

Miss., Vicksburg.—City plans for water-works and filters (previously noted) include following construction and equipment: 1,000,000-gal. coagulating basin, 500,000-gal. clear-water basin, 3,000,000-gal. filter, pumping station, pump pit and intake tower, 132 tons 4-in., 1280 tons 6 in., 450 tons 8 in., 189 tons 10 in., 643 tons 12 in., 700 tons 16 in. and 10 tons 20 in. cast-iron pipe; 55 tons 10 to 20-in. flanged cast-iron pipe and 5 tons flanged special castings, 253 fire hydrants, 3 horizontal water-tube boilers, 200 H. P. high-pressure pumps of combined steam turbine and centrifugal pump units, horizontal shaft, each with condenser and each 3,000,000 gals. daily capacity; 3 extension fur-

naces, 5-ton 46-ft. span hand-operating traveling crane, filters in 4 units, each 14½ ft. by 17½ ft. 6 in. inside dimensions and open at top, giving total filter surface 1085 sq. ft.; 2 concrete tanks and 2 concrete iron solution tanks, excavation and drainage, coal chute, filters and basins, etc.; cost \$300,000 to \$400,000; bids until Sept. 21; A. L. Dabney, Engr., Memphis, Tenn. (See Machinery Wanted.)

Mo., Butler.—City contemplates filtration plant, new source of supply, and extension of mains; probable cost \$45,000; Harper & Stiles, Engrs., Grand Ave. Temple, Kansas City, Mo. (Lately noted.)

Miss., McComb.—City, J. Dock Harrell, City Clerk, asks bids until Sept. 29 to construct proposed concrete reservoir; Xavier A. Kramer, Engr., Magnolia, Miss. (See Machinery Wanted.)

N. C., Hazlewood.—Town will issue \$15,000 water, light and sewer bonds. J. B. Hoyle, Town Clerk.

N. C., Lillington.—City plans to issue \$25,000 waterworks and sewer bonds. Address The Mayor.

N. C., Saluda.—City sold \$10,000 water, light and sewer bonds. Address The Mayor. Okla., Okemah.—City sold \$25,000 bonds for water-works extension. Address The Mayor. (Previously noted.)

Okla., Goodwell.—Oklahoma State Board of Agriculture, Oklahoma City, will extend water system at Panhandle Agricultural Institute; improvements to include 6000-gal. steel tank; bids until Oct. 1. (See Machinery Wanted.)

S. C., Columbia.—City let contract Dysard Construction Co., Atlanta, Ga., at \$3184.50 to lay water main at Epworth Orphanage; also let contracts for pipe and castings; total amount of contracts let \$4020.15; F. C. Wyse, Engr.-Supt.

Tenn., Dickson.—City voted \$5000 bonds to extend water mains. Address The Mayor.

Tenn., Friendship.—Business Men's League, D. A. Walker, Pres., interested in securing construction water-works and electric-light plant.

Tex., Cotulla.—City voted \$14,000 bonds to drill artesian well and construct water-works. Address The Mayor. (Lately noted.)

Tex., Corpus Christi.—City plans installing pumps, filtration plant and pipe line; location, Calallen, 16 mi. from Corpus Christi, on Nueces River; capacity 1,500,000 to 3,000,000 gals.; 16 mi. 20-in. mains; plans adopted; H. A. Stevens, City Engr.; Alex. Potter, Cons. Engr., 50 Church St., New York. (City lately noted to vote Sept. 3 on \$300,000 bonds for this work.)

Tex., El Paso.—City rejected bids to install pumps, boilers, air compressors and other machinery in water-works, and invites new proposals. Address The Mayor.

Tex., George West, not a P. O.—Geo. West receives bids until Sept. 10 at office of Bartlett & Ranney, Inc., Consult. Engrs., San Antonio, Tex., to construct water-works, electric-light plant and sewer system at George West, Live Oak county; plans and specifications at office Engrs.; lately noted. (See Machinery Wanted.)

Tex., Marble Falls.—City votes Sept. 5 on bonds for water-works, electric-light system, garbage disposal plant, bridge construction and street improvements. Address The Mayor.

Va., Leesburg.—City will alter and improve water system; receives bids until Sept. 8. Address E. L. Pleasants. (See Machinery Wanted.)

Va., Norfolk.—City plans expenditure \$330,000 for additional sources of water supply, to include West Neck Creek, Lake Phillips and Burr Mills; was considering lease of Norfolk County Water Co.'s plant; understood city officials will take early action to vote on bonds. W. T. Brooke, City Engr.

WOODWORKING PLANTS

Ky., Louisville—Caskets.—Louisville Casket Co., capital stock \$75,000, incptd.; Edw. F. W. Kaiser, Pres.; Martin Kaelin, V.-P.; Jacob Schreck, Secy.; Louis Stoke, Treas.

Ky., Owensboro.—Wagons.—Owensboro Wagon Co. increased capital from \$400,000 to \$500,000.

Mo., St. Louis—Staves.—Therma Automatic Stave Co., capital stock \$10,000, incorporated by J. H. Kohlmeier, Chas. De Voto and J. E. Graves.

N. C., Morehead City—Boxes.—Mayor & Loomis Co., Hertford, N. C., do not contemplate erecting factory. (Recent report was erroneous.)

FIRE DAMAGE

Ala., Montgomery.—Hudson & Thompson Wholesale Grocery Co.'s building at 124 Commerce St.; loss \$25,000.

Ala., Tuscaloosa.—Cunningham & Floyd Lumber Co.'s mill; loss \$20,000.

Ark., Jonesboro.—Two buildings on East Main St., owned by Dr. J. L. Burns; loss \$4000.

Ark., Texarkana.—Red Water Lumber Co.'s sawmill; loss \$2000 to \$3000.

Ga., Hawkinsville.—Merritt & Anderson Bros. Co.'s warehouse; loss \$25,000.

Ga., Hephzibah.—Mrs. Mary E. Palmer's residence; loss \$3000.

Ga., Stillmore.—T. R. Slapley's building, loss \$3500; R. E. Graham's store, loss \$3000; W. J. Evans' 2 stores, loss \$6000.

La., Monroe.—I. A. Lapetar's five buildings; loss \$7500.

Ky., Plano.—Jas E. Still's residence.

La., New Orleans.—Triumph Theater, at 823 Poplar St.; loss \$3800.

Mo., Bucklin.—Bucklin Lumber Co.'s plant; Geo. Smith's blacksmith shop; estimated loss \$20,000.

N. C., Asheville.—R. S. Howland's residence on Sunset Drive; loss \$60,000.

S. C., Barnwell.—Barnwell Cotton Oil Mills; loss \$65,000; branch of Southern Cotton Oil Co., 21 Broad St., New York.

S. C., Ballentine.—School at Linders; loss

\$3000; S. M. Clarkson, County Supt. of Schools, Columbia, S. C.

S. C., Georgetown.—Winyah Lumber Co.'s mill; loss \$100,000.

S. C., Greenville.—G. L. Seyle's residence; loss \$5500.

S. C., Jonesville.—M. R. Sams' residence; loss \$3000.

Tenn., Flat Creek.—Joe Parker's residence; cost \$3000.

Tenn., Memphis.—Specialty Mfg. Co.'s plant damaged; loss \$4000.

Tenn., Murfreesboro.—Red Cedar Bucket Co.'s warehouse; loss \$17,000.

Tenn., St. Elmo.—Mountain Spring Ice Co.'s plant; loss \$6000.

Tex., Lanus, P. O. at Abilene.—Machinery and four kilns at Lanus Brick Works, controlled by First State Bank of Abilene; loss several thousand dollars.

Tex., San Marcos.—W. C. Dugger's boarding-house; loss \$10,000.

Tex., Skidmore.—Dr. J. B. Hunter's residence; loss \$5000.

Tex., Terrell.—A. J. Koiler's residence on San Jacinto St.; loss \$3000.

Va., Richmond.—E. W. Bandy's residence at 1305 Barton Ave., Barton Heights; loss \$10,000.

W. Va., Wheeling.—Orpheum Theater; loss \$30,000.

W. Va., Flat Woods.—Berry Store Co.'s store and several other buildings; total loss \$25,000.

building has been postponed. (Lately noted.)

Fla., Orlando.—First Baptist Church, L. C. Townsend, Supt., has plans by J. E. Green, Birmingham, for building; \$5x5 ft.; ordinary brick construction; Spanish tile roof; cost \$25,000; mechanical heating and ventilating to cost \$1200; construction by day labor. (Lately noted.)

Ga., Atlanta.—St. Mark's Methodist Episcopal Church, Rev. A. M. Hughlet, pastor, will repair building at Peachtree and 5th Sts.; lately noted damaged by fire at loss of \$5000.

Md., Baltimore.—Trinity Church is having plans prepared by Clyde N. Friz, Munsey Bldg., Baltimore, for building at Ten Hills; brick; 42x85 ft.; cost \$9000.

Mo., Kansas City.—Rev. M. J. O'Reilly, pastor of St. Patrick's Catholic Church, is interested in erection of church, school and parsonage near Fairmount Park.

N. C., Charlotte.—Dilworth M. E. Church South will erect building; J. B. Ivey and J. T. A. Lawing, members of City Board of Church Extension.

N. C., Kinston.—Free Will Baptist Church will erect building at East and Blount Sts.; cost \$12,000 to \$15,000. Address The Pastor.

Okla., Norman.—Trustees of Presbyterian Church have plans by J. O. Parr, Oklahoma City, for building; 70x70 ft.; ordinary mill construction; slate roof; hot-air heat; bids opened Aug. 25; address Judge Wm. Eagleton. (Lately noted.)

S. C., Bishopville.—Methodist Church is having plans prepared by O. D. Wheeler, Charlotte, N. C., for building; cost \$35,000.

S. C., Marion.—Methodist church has plans by O. D. Wheeler, Charlotte, N. C., for building; cost \$60,000.

Tex., Marfa.—Presbyterian church has plans for building. Address The Pastor.

Tex., San Antonio.—Madison Square Presbyterian Church has plans by Ralph H. Cameron, 101 Upson St., San Antonio, for building on Camden St. for church, Sunday-school, manse, etc.; white stone facing; variegated slate roof; main auditorium to seat 450; Sunday-school to seat 200.

CITY AND COUNTY

Ala., Birmingham—Jail.—Board of Revenue of Jefferson county accepted plans by Harry B. Wheelock, Birmingham, for jail; 12 to 14 stories; 50x93 ft.; cells 12x7½ ft.; lower floor for courts; concrete or brick; lighting and heating apparatus in basement to supply new structure and old courthouse; cost \$300,000; plans ready for bids about Oct. 10. (Lately noted.)

Ala., Inglenook, P. O. at Birmingham—City Hall.—City voted \$3000 bonds to erect city hall. Address The Mayor.

Ga., Savannah—Library.—Library Commission approved plans by H. W. Witcover, Savannah, for Carnegie library; 2 stories; 90x130 ft.; exterior faced with granite or marble; will take bids on both materials; portico with large columns and pilasters; lecture-room to seat 350; fireproof vaults in library proper; Beverly S. King, consulting architect, 103 Park Ave., New York; plans ready for bids about Oct. 1. (Lately noted.)

Md., Baltimore.—Comfort Station.—City opened bids to erect 13-ft. addition to comfort station in Center Market Pl. and Lombard St.; Chas. Herbold & Sons, 2729 W. North Ave., are lowest bidders at \$2443.89.

Miss., McComb City—City Hall.—City, J. Dock Harrell, City Clerk, receives bids until Sept. 29 to erect City Hall; reported cost about \$20,000; plans and specifications at office of Xavier A. Kramer, Engr. and Archt., Magnolia, Miss., and at office of City Clerk.

Miss., Meridian—City Hall.—City receives bids until Sept. 22 to erect city hall; 7 stories; auditorium to seat 3500; fireproof; gravel roof; steam heat; P. J. Krouse, Archt., Meridian; R. L. Blanks, City Clerk and Treas. (Lately noted to cost \$100,000.)

N. C., Wilmington—Fire Station.—City has plans by Jas. F. Gause, Jr., Wilmington, for engine-house; 28x57 ft.; brick; slate roof; electric lighting; cost \$5500; plans ready by Sept. 5. (See Machinery Wanted.)

Tex., Dallas—Comfort Stations.—City is having plans prepared by J. E. Overbeck, 708-9 Wilson Bldg., Dallas, for underground comfort station at Elm, Ervay and Live Oak Sts.; 41x42 ft.; reinforced concrete; concrete and sidewalk prism glass; cost \$20,000. Address architect. (Lately noted.)

Tex., Houston—Barn.—Harris county, H. L. Washburn, Auditor, receives bids until Sept. 7 to erect barn at county jail; plans and specifications on application.

BUILDING NEWS

BUILDINGS PROPOSED

APARTMENT-HOUSES

D. C., Washington.—John M. Donn, 1506 H St. N. W., states erection of apartment-house has been indefinitely postponed. (Lately noted.)

D. C., Washington.—C. Edgar Webb, 237 Rhode Island Ave. N. W., Washington, is reported to have prepared plans for 2-story flat building on Georgia Ave. N. W.; brick; slag roof; cost \$9000; owner's name withheld.

D. C., Washington.—Reginald W. Geare, 1421 H St. N. W., Washington, prepared plans for 2-story store and apartment-house; brick; slag roof; cost \$6000; location and owner's name withheld.

D. C., Washington.—Geo. T. Santnyer, 412 Dist. Natl. Bank Bldg., Washington, prepared plans for apartment-house on 6th St. near East Capitol St.; 37x110 ft.; tapestry brick and terra-cotta exterior; wrought-iron balconies; galvanized-iron cornice; slag roof.

D. C., Washington.—J. E. Jennings has plans by W. E. Nichols, Oxford Bldg., Washington, for apartment-house at Kalorama and Columbia Rds.; 4 stories and basement; brick; Indiana limestone trimmings; semi-fireproof; slag roof; galvanized-iron cornice; 40x98 ft.; 21 suites; marquise; mosaic floors; Italian marble wainscoting; cost \$30,000.

Fla., Jacksonville.—W. F. Pipes of Pipes Realty Co., Barnett Bldg., will erect apartment-house and stores. (See Stores.)

Fla., West Palm Beach.—Alice M. Knoll will erect apartment-house; 36x75 ft.; 4 suites.

Mo., St. Louis.—P. M. Boyd will erect two 2-story tenements at 4240-42 and 4259-61 Delmar St.; cost \$13,000; construction by owner.

Tenn., Nashville.—Mrs. M. J. McGuire will erect apartment-house near Ellison and 23d Sts.; 3 stories and basement; hollow tile; cost \$30,000; Harry J. Frank, Archt., Nashville.

Tex., Galveston.—Galveston Brewing Co., A. L. G. Griffith, Cash., has no definite plans to erect apartment and store building. (See Stores.)

Va., Norfolk.—Otto B. Williams will erect apartment-house; 2 stories; 2 suites; cost \$3750.

W. Va., Weston.—W. C. Weber and B. E. Wells will erect building for garage and apartments. (See Motors and Garages.)

ASSOCIATION AND FRATERNAL

Ala., Dothan.—Dothan Lodge No. 1133, B. P. O. E., will erect building.

D. C., Washington.—Colored Masonic Temple Assn. has plans by Cloughton West, 200 Corcoran Bldg., Washington, for building at

10th and U Sts. N. W.; 5 stories and basement; Italian Renaissance style; fireproof; steel construction; reinforced concrete floors; slag roof; 93x134 ft.; tapestry brick with Indiana limestone and granite trimmings; ornamental galvanized cornice; wrought-iron grills at windows; roof garden laid in red tile; banquet hall 50x75 ft.; marble corridors bordered in mosaic design; cost \$125,000.

Fla., Sanford.—B. P. O. E. will not erect building at present, as lately reported.

Ky., Louisville.—Highland Park Masonic Hall Assn. incptd. with \$5000 by Fred Reichert, Jos. S. Lutz, S. G. Lord and others to erect lodge hall in Highland Park.

Tex., Houston.—Grand United Order of Brothers and Sisters of Love and Charity, L. H. Simpson, grand worshipful sovereign, is reported to erect temple; 3 stories and roof garden; 50x100 ft.; cost \$20,000.

BANK AND OFFICE

Tenn., Memphis.—G. M. Shaw & Co., Tennessee Trust Bldg., Memphis, prepared plans for store and office building. (See Stores.)

Tex., Waco.—W. T. Watt will probably let contract in 60 days to erect office, store and hotel building. (See Hotels.)

W. Va., Logan.—A. I. Brown, New York, will expend \$20,000 to \$25,000 to erect bank and office building; 40x120 ft.; fireproof; tin roof; heating not determined; gas and electric lighting. (Lately noted having plans by Weber, Werner & Adkins, Cincinnati.)

CHURCHES

Ala., Eufaula.—First M. E. Church, E. B. Weeden, Chmn. Building Com., will expend \$20,000 to erect building; 115x75 ft.; ordinary construction; tin roof; steam heat; electric lighting; Sayre & Baldwin, Archts., Anderson, S. C., and Citizens' National Bank Bldg., Raleigh, N. C.; bids opened Sept. 1. (Lately incorrectly noted at S. C., Eufaula.)

Ala., Gadsden.—First Presbyterian Church, Rev. R. Excell Fry, pastor, rejected all bids to erect building and will construct by day labor under direction of A. B. Simpson, Gadsden; may let subcontracts; will purchase materials; plans call for structure 47x90 ft.; ordinary construction; slate roof; gas-steam radiators; electric lights; cost about \$12,000. (Lately noted.)

Ala., Mobile.—All Saints' Episcopal Church lets contract Sept. 5 for concrete foundations and reinforced concrete and hollow-tile floor for building; lets contract about Sept. 26 for superstructure; cost \$35,000; Jno. A. Wetzel, 533 Citizens' Bank Bldg., and Jos. Stone, Asso. Archts. (Lately noted.)

Fla., Mulberry.—W. P. Read, Secy. of Building Com., states erection of church

Tex., Wichita Falls—Fire Station.—City will issue \$7500 bonds to erect fire station. Address The Mayor. (Previously noted.)

Va., Richmond—Municipal.—City receives competitive plans until Oct. 10 from local architects for municipal building; Indiana limestone with ornamental terra-cotta or artificial stone; 3,000,000 cu. ft. space; 3 sections, including public library, auditorium and five courts; auditorium to seat at least 3000; probably 2 or more lecture-rooms; cost \$500,000 to \$1,000,000; programs arranged by Alfred C. Bosson, Consulting Archt., 366 Fifth Ave., New York, at office of Alfred H. McDowell, Clerk of Council Com., Room 311 City Hall. (Lately noted.)

COURTHOUSES

Ala., Birmingham.—Board of Revenue of Jefferson county accepted plans for jail with courtrooms on first floor. (See City and County.)

Ala., Gadsden.—Etowah County Comms. will improve courthouse; details not decided; will repair walls and roofing, probably renew interior woodwork and install seats; L. L. Herzberg, Chrmn. of Board.

Fla., Jacksonville.—Duval County Comms. will expend \$150,000 to erect annex to courthouse; 3 stories and basement; 69x101 ft.; fireproof reinforced concrete frame; Barrett's specification roof; one-pipe gravity steam system of heating; electric passenger elevator; Talley & Sumner, Archts., St. James Bldg., Jacksonville. (Lately noted to receive bids until Sept. 16.)

Ky., Lancaster.—Garrard County Comms. are considering \$15,000 bond election in November for courthouse.

Tenn., Manchester.—Coffee County Comms. open bids Sept. 12 to enlarge courthouse; 20x50 ft.; cost \$5000; address proposals to C. M. N. Farrar, Hillsboro, Tenn. Lately noted having approved plans.)

DWELLINGS

Ala., Birmingham.—Dr. B. S. Lester has plans by Miller & Martin, 910 Title Guarantee Bldg., Birmingham, to erect dwelling; 2 stories and basement; frame; composition shingle roof; furnace heat; cost \$5500; bids opened about Aug. 29.

Ala., Birmingham.—Leo Loeb has plans by Miller & Martin, Birmingham, for residence; 2 stories; frame.

Ala., Mobile.—Dr. W. H. Kemp has plans by John A. Wetzel, Citizens' Bank Bldg., Mobile, for dwelling; 9 rooms; fireproof; hollow tile; hot-air heat; tile roof; electric lights; cost \$10,000.

Ala., Mobile.—M. Waring Harrison will expend \$12,000 to erect residence; 80x35 ft.; ordinary construction; tile roof; hot-air heat; central lighting plant; Hutchisson & Denham, Archts., Mobile; bids opened Sept. 5. (Lately noted.)

Ala., Prattville.—P. G. Graham will erect residence; 2 stories; frame; electric lights; cost \$4000; Smith & Carter, Archts., Montgomery.

Ala., Seale.—Glenn Ferrell, Selma, Ala., contemplates erecting dwelling; details not complete.

Ark., Little Rock.—John S. Braddock will erect residence at 3509 High St.; cost \$4000.

Ark., Little Rock.—Brooks Bros. will erect four 2-story brick veneer residences in 2100 block Louisiana St.; cost \$20,500.

D. C., Washington.—H. F. Mandler has plans by Geo. T. Santnyer, 412 Dist. Natl. Bank Bldg., Washington, for residence at 41st and Harrison Sts.; 2 stories; stucco and frame; colonial; 6 rooms; sleeping porches; cost \$6000.

D. C., Washington.—R. F. Lukier has plans by Geo. T. Santnyer, 412 Dist. Natl. Bank Bldg., Washington, for residence on 16th St. Heights; 23x32 ft.; 10 rooms and 2 baths; sleeping porches; cost \$6000.

D. C., Washington.—H. A. Kite, 1338 G St., will expend \$3000 to erect dwelling at 203 12th St. N. E.; 18x40 ft.; ordinary construction; slag roof; hot-water heat; gas and electric lighting; A. E. Landvoigt, Archt., 713 14th St., Washington; construction by owner. (Lately noted.)

D. C., Washington.—Mrs. E. M. Hughes has plans by G. T. Santnyers, 412 District National Bank Bldg., Washington, for 2 bungalows on Belt Rd.; frame and shingles; cost \$7000.

D. C., Washington.—Sylvanus Stokes has plans by A. H. Sonneman, 1334 H St. N. W., Washington, to remodel residence; cost \$7000.

D. C., Washington.—C. Edgar Webb, 237 Rhode Island Ave. N. W., Washington, is reported to have prepared plans for residence

on Quincy St. N. E.; 21x34 ft.; 2 stories; brick; slag roof; cost \$4500.

D. C., Washington.—D. F. Groff has plans by N. R. Grimm, Bond Bldg., Washington, for 15 dwellings at Illinois and Georgia Aves.; 2 stories and basement; brick; 22x55 ft.; cost \$40,000.

D. C., Washington.—A. H. Sonneman, 1334 H St. N. W., Washington, prepared plans for 3-story residence at 1730 Massachusetts Ave. N. W.

D. C., Washington.—Chas. L. Tankersley, 1886 Monroe St. N. W., has plans by W. E. Howser, 614 G St. N. E., to erect five 2-story dwellings at 3624-32 New Hampshire Ave., to cost \$15,000; construction by owner.

Fla., Chipley.—A. R. Wells will erect residence.

Fla., Daytona.—Clark R. Richardson, Holly, Mich., will erect residence.

Fla., Homestead.—E. M. Martin, Key West, will erect residence in Woodlawn addition.

Fla., Jacksonville.—W. F. Pipes of Pipes Realty Co., Barnett Bldg., will erect 4 dwellings; cost \$11,900.

Fla., Jacksonville.—Brown Realty Co. will expend \$5000 to erect dwelling; 2 stories; frame; vulcanite roofing; plans and construction by owner. (Lately noted.)

Fla., Jacksonville.—T. E. Floyd will erect 1-story frame dwelling on Spearing St.; cost \$3200.

Fla., Jacksonville.—J. W. Hill will erect 2-story frame dwelling on Post St.; cost \$3500.

Fla., Jacksonville.—E. R. Yeager will erect residence; 1½ stories; frame; cost \$2800.

Fla., Miami.—Carl G. Fisher, 210 12th St., has plans by Geo. L. Pfeiffer, Miami, for residence and will soon let contract to erect; 106x53 ft.; 2 stories, except central portion, which will be carried 3 stories to provide roof garden; Italian renaissance; concrete floors; lounge-room 24x40 ft., with tiled floors; swimming pool enclosed and roofed with glass, supported by steel skeleton superstructure; 2-story garage and chauffeur's residence; cost \$65,000. (Previously noted.)

Fla., Plant City.—R. Boyett will erect residence.

Fla., Sarasota.—Lee B. Hatch and W. T. Wint will erect bungalows.

Fla., St. Petersburg.—C. F. Reese will erect 12-room residence; cost about \$3000.

Ga., Atlanta.—W. Wood White will expend \$10,000 for alterations and additions to residence at 32 Howard St.

Ga., Atlanta.—Wm. Rawlings will erect \$8000 residence.

Ga., Atlanta.—S. W. Sullivan will erect 2 one-story and 3 two-story residences at 169-71 Elizabeth St. and 209-11-13 Lake Ave.; cost \$16,000; day labor.

Ky., Louisville.—Clara A. Krieger will erect brick-veneer dwelling at 4226 W. Broadway; cost \$3500.

Ky., Louisville.—Wm. L. Jacobs will erect frame dwelling at 1507 E. Breckenridge St.; also frame cottage and repair building at 1503 E. Breckenridge St.; cost \$3400.

Ky., Louisville.—Ida B. Terrell will erect brick-veneer dwelling at 2025 Barringer Ave.; cost \$3500.

Md., Baltimore.—Abraham Silberstein, 2206 E. Baltimore St., will erect 18 dwellings on Engle property on 38th St. between Greenmount Ave. and Old York Rd.; 2 stories; porch front; brick.

Md., Baltimore.—Ten Hills Corp. is having plans prepared by Clyde N. Friz, Munsey Bldg., Baltimore, for 2 residences at Ten Hills; frame; 24x40 ft. and 22x35 ft.; ordinary construction; shingle roof; hot-water heat; cost \$10,000.

Md., Baltimore.—Philip S. Morgan of Edwin Turnbull & Co., 12 E. Lexington St., will erect 14 dwellings in 2800 block Winchester St.; vitrified brick; marble trimmings; porch fronts; uniform depth 100 ft.; frontage 14 and 15 ft.; cost about \$1800 each.

Md., Baltimore.—Frank Novak Realty Co. has plans by Callis & Callis, 2055 Kennedy Ave., Baltimore, for 15 dwellings on Herkimer St.; 13x42 ft.; ordinary construction; tarred roof; furnace heat; gas lighting. (August Webber lately noted to erect dwellings, and above company contractor.)

Md., Roland Park.—Dr. Donald Hooker is receiving bids to erect residence at Belvedere Ave. and Falls Rd.; stone; 2½ stories; contractors estimating are: Cowan Building Co., 106 W. Madison St.; G. Walter Tovell, Eutaw and McCulloh Sts.; Gladfelter & Chambers, 2074 Woodberry Ave., all of Baltimore; Edw. L. Palmer, Jr., Archt., 408 Roland Ave., Roland Park. (Previously noted.)

Md., Chevy Chase.—W. H. Price has plans by B. Stanley Simmons, 1340 New York Ave.

N. W., Washington, D. C., for residence; 2 stories; 34x42 ft.; hollow tile walls; stucco finish; architect is receiving bids; cost \$9000. (Lately noted.)

Miss., Biloxi.—L. H. Manuel will erect 2 residences; bungalow type.

Mo., Kansas City.—Rev. M. J. O'Reilly, pastor of St. Patrick's Catholic Church, is interested in erection of parsonage. (See Churches.)

Mo., Kansas City.—Ward Clay has plans by Shepard & Belcher, Kansas City, for residence; colonial style; brick; 68x47 ft.; hollow-tile lining.

Mo., St. Louis.—Lewis Realty & Building Co. will erect 3 one-story dwellings at 4551-55-71 Sacramento St.; cost \$5400; construction by owner.

Mo., St. Louis.—Jos. Habermehl will erect 2-story dwelling at 4233 Junata St.; cost \$3000; construction by owner.

Mo., St. Louis.—Geo. Curtis will erect \$5000 residence at 38th St. and Lindell Blvd.

Mo., St. Louis.—Harry Noback will erect 3 brick residences; cost \$6000.

N. C., Charlotte.—Conrad & Garner will erect dwellings to cost \$6000.

N. C., Winston-Salem.—A. S. Hanes will erect 2 residences.

Okla., Oklahoma City.—Dr. Robt. Hull will erect dwelling at 623 Classen Blvd.; cost \$8000.

Tenn., Nashville.—Wm. E. Wilkerson will erect frame bungalow at 1011 Carithers St.; cost \$3000.

Tenn., Nashville.—Duncan Kenner is reported to have plans by Hart & Gardner, Nashville, for residence in Lynwood; Italian renaissance; stucco on brick; cost \$30,000.

Tenn., Ovoca, P. O. Tullahoma.—H. W. Stratton, Supt. of Pythian Home, will erect bungalow; C. K. Colley, Archt., Nashville.

Tex., Galveston.—Harris-Irby Cotton Co. will erect frame cottage; cost \$6500.

Tex., Houston.—F. E. Johnson will erect 7-room residence at 807 Oxford St.; cost \$4500.

Tex., San Antonio.—Madison Square Presbyterian Church will erect manse, etc. (See Churches.)

Va., Graham.—W. F. Raugh will erect residence on Greever Ave.

Va., Fredericksburg.—G. Frank Timberlake is having plans prepared by Phillip N. Stern, Fredericksburg, for residence at Prince Edward and Lewis Sts.; 48x36 ft.; brick walls; wood joists; asbestos roof; hot-water heat; open bids in about one month.

Va., Norfolk.—W. I. Simpson will erect residence on 36th St.; 2 stories; frame; cost \$4000.

W. Va., Cameron.—R. A. McCannaghey will erect residence; brick veneer; 10 rooms; colonial style; cost \$10,000; Geo. H. Dieringer, Archt., Wheeling.

W. Va., Huntington.—Otto A. Myras will erect 2-story brick residence on 10th St.; cost \$3100.

W. Va., Huntington.—Wm. McCue will erect 2-story brick residence on 13th Ave. near 9th St.; cost \$7000.

W. Va., Huntington.—E. L. Miller will erect residence at 1019 7th St.; 28x37 ft.; brick; ordinary construction; slate roof; natural-gas heating; electric lights; cost \$3500; construction by day labor.

GOVERNMENT AND STATE

Fla., Pensacola.—Laboratory.—State Board of Health, Jacksonville, will expend \$20,000 to erect laboratory; 37x52 ft.; fireproof; tile roof; hot-water heat; electric lighting; pressed brick; stone and terra-cotta trimmings. Address proposals to architect or Dr. S. R. M. Kennedy, Pensacola. (Lately noted to receive bids until Sept. 15.)

Miss., Tupelo.—Postoffice.—Treasury Dept., Oscar Wenderoth, Supervising Archt., Washington, D. C., opened bids to erect postoffice; 1 story, mezzanine and basement; 4000 sq. ft. ground area; brick facing; W. H. Fissell & Co., 1133 Broadway, New York, are lowest bidders at \$44,979 for limestone and \$46,116 for sandstone construction. (Lately noted.)

Mo., St. Louis.—Postoffice.—Treasury Dept., office of Oscar Wenderoth, Supervising Archt., Washington, D. C.—Bids Sept. 28 for painting and repairs to U. S. postoffice; specifications from custodian at site and on application to this office, at discretion of Supervising Architect.

Tenn., Cookeville.—Postoffice.—Treasury Dept., Oscar Wenderoth, Supervising Archt., Washington, requested original bidders for

erection of postoffice to submit supplementary bids; structure to be 3 stories and basement; 5000 sq. ft. ground area; first floor fireproof; stone; ornamental terra-cotta; brick facing; composition slate roof. (W. H. Fissell & Co., New York, lately noted as lowest bidders.)

Tex., Abilene.—Hospital.—Managers of Epileptic Colony open bids Sept. 4 to erect 2-story hospital building; fireproof; tar and gravel roof; cost \$35,000; steam heat (vacuum return), \$3000; electric lights, \$250; M. L. Waller & Co., Archts., 209½ W. 8th St., Fort Worth. (Lately noted.)

Tex., Longview.—Postoffice.—Treasury Department, Oscar Wenderoth, Supervising Archt., Washington, D. C., rejected all bids to erect postoffice; 2 stories and basement; non-fireproof; stone and brick facing; composition and slate roof. (Lately noted.)

Va., Hanover County.—Home.—State Board of Charities has plans by Mr. Sugden, Hampton Industrial Institute, Hampton, Va., for Industrial School for Colored Girls in Hanover county; brick; 2 stories and basement; accommodations for 16 girls and matron.

HOTELS

Ga., Savannah.—Georgia Hotel Co. is reported to have received bids to complete tourist hotel.

Okla., Ardmore.—Frank Upman, Woodward Bldg., Washington, D. C., is reported preparing plans for 6-story hotel.

Tex., George West.—(not a postoffice).—Henry T. Phelps, Archt., 707 Gunter Bldg., San Antonio, receives bids until Sept. 10 to erect 2-story reinforced concrete and brick hotel for George W. West.

Tex., Waco.—W. T. Watt will probably let contract in 60 days to erect hotel, store and office building; 165x198 ft.; fireproof; independent lighting plant in basement; cost \$100,000; Milton W. Scott, Archt., Waco; plans complete in 30 days. (Previously noted.)

MISCELLANEOUS

Ala., Birmingham.—Bathhouses.—Tennessee Coal, Iron & R. R. Co. will expend about \$5000 to improve baths for employees at Edgewater mines.

Ala., Mobile.—Home.—Alabama Episcopal Church Home will have plans ready by Oct. 1 for cottages and administration building for home; accommodations for 150 children; hollow-tile construction with stucco trimmings; tile roof; cost \$45,000; Jno. A. Wetzel, Archt., 533 Citizens' Bank Bldg., Mobile. (Previously noted.)

Fla., Palatka.—Bathhouses, etc.—Dr. G. S. Davis acquired Whiggs Lake property and will establish resort; erect bathhouses, dance pavilion, etc.

Ga., Savannah.—Settlement-house.—Jewish Educational Alliance has plans by H. W. Witcover, Savannah, for building and are receiving bids; 3 stories; red brick and stone exterior; cost \$50,000 to \$75,000; Rigo Myers, Rabbi Geo. Solomon, B. H. Levy and others, Building Com. (Previously noted.)

La., New Orleans.—Clubhouse.—Louisiana Chapter House Assn. will erect 2-story frame clubhouse; cost \$7000.

Md., Baltimore.—Stable.—Slack & Slack Co. is having plans prepared by J. C. Spedden, 1640 Hanover St., Baltimore, for stable in rear 2509-29 Guilford Ave.; brick; 200x30 ft.; cost \$10,000.

Md., Baltimore.—Hospital.—Maryland General Hospital has plans by C. M. Anderson, 324 N. Charles St., Baltimore, for improvements to hospital; remove partitions on fifth floor and provide operating-rooms, etc.; cost about \$10,000; Cowan Building Co., 106 W. Madison St., Baltimore, is estimating.

Md., Glen Echo.—Memorial.—Norcross Bros. Co., Worcester, Mass., has not received contract to erect Clara Barton memorial building as lately reported.

Mo., St. Louis.—Clubhouse.—Missouri Athletic Assn. is having preliminary plans prepared by G. F. A. Brugemann, Third National Bank Bldg., and Wm. B. Ittner, Board of Education Bldg., St. Louis, for clubhouse at 4th St. and Washington Ave. (Previously noted.)

Tenn., Memphis.—Sanitarium.—Drs. G. F. Pettet and W. R. Wallace have plans by John Gaisford, Memphis, for sanatorium on South Parkway; 3 stories and roof garden; red brick; white ornamental trimming; colonial front; elevator; 100x180 ft.; cost \$70,000.

Tex., Houston.—Sheds.—Wells-Fargo & Co. Express, 51 Broadway, New York, will erect cement open shed and brick loading platform at Washington and 9th Sts.; cost \$3623.

RAILWAY STATIONS, SHEDS, ETC.

Mo., Webb City.—St. Louis & San Francisco Ry., V. K. Hendricks, Engr., St. Louis, is reported to begin construction of passenger station Sept. 15 and complete by Dec. 31; stone, brick or cement; cost about \$25,000. (Previously noted.)

Fla., Winter Haven.—Atlantic Coast Line Ry., E. B. Pleasants, Ch. Engr., Wilmington, N. C., will erect depot to cost \$13,000.

Va., Salem.—Virginian Ry., H. Fernstrom, Ch. Engr., Norfolk, will erect station; about 30x100 ft.; rough-faced brick and wood; slate roof; cost \$7000 to \$8000.

SCHOOLS

Ala., Inglenook, P. O. at Birmingham.—City voted \$9000 bonds to erect school and \$3000 to erect city hall. Address The Mayor.

Ala., Carrollton.—City voted bonds to erect addition to school; cement construction; work begun; completion by Oct. 14. Address The Mayor.

Ark., Prescott.—City opened bids to erect school; J. A. Fincher, Memphis, Tenn., is lowest bidder for brick and frame construction at \$54,000; F. B. Young & Son, Memphis, are lowest bidders for brick and concrete at \$68,976.

D. C., Washington.—Miss Nannie Burroughs opens bids Oct. 15 through W. A. Rayfield & Co., Architects, 649, Birmingham, to erect dormitory; 50x100 ft.; semi-fireproof; composition roof; steam heat; electric lighting; dumb-waiter; cost \$30,000.

Fla., Baker.—Board of Education, J. T. Diamond, Supt., Milton, Fla., has plans by W. D. Willis, Pensacola, for 8-room school; bids opened Sept. 1.

Fla., Dade City.—School Dist. No. 4, Pasco county, voted \$4000 bonds to erect school; Willis R. Biggers, Archt., Tampa. (Lately noted.)

Fla., Fort Lauderdale.—School Board receives bids until Sept. 7 to erect school; "T" shape; corridors in cement wainscoting; indirect lighting system; cost \$55,000; W. C. DeGarmo, Archt., Miami. (Lately noted.)

Fla., Molino.—Molino School Dist., A. S. Edwards, Supt., will erect 3-room school and provide fire-escape at School No. 1; bids received until Aug. 28.

Fla., Tampa.—Tampa School Dist. will erect school at Moody Heights to cost \$25,000; J. B. Anderson, Chrmn. of Trustees. (Other schools previously noted.)

Fla., Winterhaven.—Winterhaven School Dist. has plans by Wm. L. Redditt, Tampa, Fla., for school; 18 classrooms; auditorium to seat 800; domestic science and manual-training equipment; brick facing; terra-cotta trimmings; tile roof; cost \$40,000. (Lately noted.)

Ga., Buchanan.—Buchanan School Dist. votes Sept. 19 on \$15,000 bonds to erect school. Address Dist. School Trustees.

Ga., Canton.—City will expend \$25,000 to erect school; 53x40 ft.; 2 stories; brick veneer; Chas. W. Carlton, Archt., Lagrange, Ga. (Lately noted.)

Ga., Cordele.—City opens bids Sept. 10 to erect grammar school; 50x90 ft.; 2 stories; brick veneer; pitch and gravel roof; cost \$10,000; Chas. W. Carlton, Archt., Lagrange, Ga. (Lately noted.)

Ga., Donaldsonville.—Donaldsonville School Dist. opens bids in about 60 days to erect school; to accommodate 550; fireproof; tin or paper roof; steam heat; cost \$12,500; architect not selected. Address J. F. Brown, Donaldsonville. (Lately noted as voting \$15,000 bonds.)

La., Baskin.—Franklin Parish School Board, Jno. L. McDuff, member, Winnsboro, La., will empower building committee in about 30 days to select architect to prepare plans and call for bids, etc., for \$12,500 school; ordinary construction. (Ward 6 lately noted voting tax to raise \$16,000 for school building.)

La., Baton Rouge.—Southern University receives bids until Sept. 12 to erect two-story brick dormitories; Favrot & Livaudais, Architects, 505 Perrin Bldg., New Orleans.

La., Fenton.—Jefferson Davis Parish School Board, Jennings, La., proposes election on bonds to erect \$7000 school.

La., Crowley.—Crowley School Dist. defeated \$16,000 bond issue to erect school. (Lately noted.)

La., New Orleans.—State votes Nov. 14 on amendment to constitution authorizing City of New Orleans to issue \$2,000,000 bonds to erect 10 schools and additions to other buildings; Sol Wexler, Prest. Board of Directors Public Schools. (Lately noted.)

Md., Cumberland.—Allegany County Commissioners receive bids through John E. Edwards, Supt. of Schools, 7 Union St., until Sept. 15 to erect graded school; 2 stories; 64x55 ft.; fireproof; composition roof; hot-air heat; gas and electric lights; separate bids for heating and ventilating; cost \$25,000; plans and specifications at office of board as above and Holmboe & Lafferty, Architects, New York, and Clarksburg, W. Va. (Lately noted.)

Md., Hyattsville.—Town, Dr. W. Latimer, Chrmn. of Building Comm., opens bids Sept. 9 to erect high school; 70x90 ft.; ordinary construction; slate roof; steam heat; electric lighting; Hunter & Bell, Architects, Southern Bldg., Washington, D. C. (Lately noted.)

Md., Midland.—Allegany County School Commrs., A. Taylor Smith, Prest., 7 Union St., Cumberland, Md., receive bids until Sept. 14 to erect 2-story brick addition to school; plans and specifications at office of board and Wm. F. Elder, Archt., Cumberland.

Miss., Gulfport.—Mississippi Humane Society purchased 40-acre site for proposed boys' industrial school.

Mo., Kansas City.—Rev. M. J. O'Reilly, pastor of St. Patrick's Catholic Church, is interested in erection of school, etc. (See Churches.)

Mo., Osceola.—Osceola School Dist. voted \$10,000 bonds for schools. Address Dist. School Trustees.

N. C., Raleigh.—City will erect school; 4 rooms to be erected at present; ultimate cost \$25,000; 2 stories and full basement; brick walls; reinforced concrete floors, columns and roof; fireproof; Frank B. Simpson, Archt., Raleigh.

N. C., Salisbury.—St. John's Lutheran Church will erect school; 2 stories; frame. Address The Pastor.

N. C., Spray.—School Com. receives bids until Sept. 15 to erect 11-room school; plans and specifications at office of W. C. Northup, Archt., Winston-Salem, N. C.

Okl., Goodwell.—Oklahoma State Board of Agriculture, Oklahoma City, Benj. Hennessy, Secy., will receive bids until Oct. 1 for improvements to boys' dormitory, including furnishing and laying 5-ply composition glass guaranteed roof on deck, replacing broken glass, painting outside woodwork, treating concrete blocks on outside with 2 coats waterproofing material, etc. (See Machinery Wanted.)

Okl., Tulsa.—Bids received by Supt. of City Schools until Aug. 31 to erect 8 or more one-room school buildings as follows: Two on Riverview school grounds, two on Washington school grounds, two on Osage school grounds and two on Irving school grounds; A. A. Bumgarner, Chrmn. Bldg. Com.

Tenn., Knoxville.—Knox County Board of Education, M. W. Wilson, Supt., opens bids in about 30 days to erect 3 schools; 60x80 ft. each; slate roof; steam heat; cost \$12,000; L. C. Waters, Archt., Knoxville. (Lately noted to erect \$15,000 school building at Camp Grove.)

Tenn., Rives.—Building Com. opens bids Sept. 7 to erect school; 87x57 ft.; asphalt shingle roof; hot-air heat; H. P. Taylor, Archt., Union City, Tenn. (Lately noted.)

Tex., Canyon.—State Normal School Board of Regents, Austin, receives bids until Sept. 26 to erect fireproof main building; plans at office of George Albert Endress, Archt., Littlefield Bldg., Austin, and office of R. B. Cousins, Prest. Normal School Board, Canyon, or at office of Mosher Iron Works, Dallas.

Tex., Gilmer.—Gilmer Ind. School Dist. voted \$35,000 bonds to erect schools. Address Dist. School Trustees.

Tex., George West (not a postoffice).—Henry T. Phelps, Archt., 707 Gunter Bldg., San Antonio, receives bids until Sept. 10 to erect 2-story brick school building for Geo. W. West.

Tex., Richland.—City will erect \$10,000 school; brick. Address The Mayor. (Lately noted voting bonds.)

Tex., San Antonio.—Bexar County Common School Dist. No. 18 is reported to vote on \$24,000 bonds to erect school. Address Dist. School Trustees.

Va., Richmond.—City rejected all bids to erect Nathaniel Bacon school; will revise plans and readvertise for bids; Carneal & Johnston, Architects, Richmond. (Lately noted to cost \$40,000.)

W. Va., Logan.—Board of Education, Chas. Avis, Secy., will expend \$18,000 to erect high school; 50x104 ft.; brick; slate roof; steam heat; contract not let as lately reported.

W. Va., Princeton.—Board of Education opens bids September 5 to erect four one-room

and two three-room school buildings; ordinary construction; hot-air heat; electric lighting; metal or shingle roof; cost \$10,000; A. F. Wysong, Archt., Phinceton.

STORES

Ala., Mobile.—Hutchisson & Denham, Architects, Mobile, state Carney Lumber Co. will not erect arcade building, as lately reported.

Ala., Troy.—Joe M. Coskrey will erect one-story brick store building.

Ark., Arkadelphia.—G. A. Trigg is erecting store building to replace structure previously noted burned.

Ark., Jonesboro.—J. L. Burns will erect store; 50x80 ft.; mill construction; cost \$4000; probably let contract to local contractor.

D. C., Washington.—Gus Brahler has plans by Jones & Bubbs, Riggs Bldg., Washington, for 2 stores at 4th and H Sts. N. W.; 1 story; brick; slag roof; cost \$6000.

D. C., Washington.—Reginald W. Geare, 1421 H St. N. W., Washington, prepared plans for store and apartment-house. (See Apartment-Houses.)

Fla., Bartow.—L. Hebt will erect business block; 2 rooms; 50x90 ft.; one story; cement walls; metal roof; cost \$3000 to \$4000.

Fla., Bowling Green.—T. A. Cumble will erect building to contain 5 stores.

Fla., Jacksonville.—W. F. Pipes of Pipes Realty Co., Barnett Bldg., will erect store and apartment-house to cost \$15,000 and store to cost \$5000. (Lately noted.)

Fla., Jacksonville.—J. C. Halsema will erect one-story concrete building on Forbes St.; cost \$7000.

Fla., Orlando.—Dr. C. D. Christ has plans by J. F. Ange, Orlando, for store building; 3 stories; 40x70 ft.; metal roof; cost \$33,000; day labor.

Ga., Augusta.—P. J. Sharkey will erect building at 9th St. and Wrightsboro Rd.; frame; 2 stories; 28x50 ft.

Ga., Lithonia.—Mrs. Mattie Roberts will erect store building to be occupied by T. H. Knox.

Md., Baltimore.—Read Drug & Chemical Co., R. A. Nattans, Gen. Mgr., Howard and Lexington Sts., is reported to erect structure to replace building lately noted burned; 6 stories.

Md., Baltimore.—Enterprise Steam & Hot Water Heating Co., 407 N. Howard St., is reported to have invited following bidders to estimate on construction of store and warehouse at 600 N. Howard St.: John S. Busick, 2811 Rayner Ave.; Cowan Building Co., 106 W. Madison St.; Chas. L. Stockhausen Co., Marine National Bank Bldg.; Milton C. Davis, 15 E. Fayette St.; Wm. Ferguson & Bro., 214 Clay St.; B. F. Bennett Building Co., 123 S. Howard St.; Geo. Bunnecke & Son, 305 St. Paul St., all of Baltimore; structure to be 3 stories; ornamental brick; plate-glass show windows. (Previously noted.)

Mo., St. Louis.—Cora Marcoux will erect \$6000 store building at 40th and Donovan Sts.

N. C., Raleigh.—Tucker estate will expend \$15,000 to remodel building and construct 2 storerooms on Martin St.; plate-glass windows; marble fronts.

N. C., Salisbury.—V. Wallace & Sons will erect store building; 1 story.

N. C., Salisbury.—Mrs. Nellie Pearson will erect 2-story addition in rear building 110 N. Main St.

Tenn., Jellico.—McComb Supply Co. organized; will erect building.

Tenn., Memphis.—G. M. Shaw & Co., Tennessee Trust Bldg., Memphis, prepared plans for building at Main St. and Monroe Ave.; reported to be 4 stories and basement; 3 floors to be occupied by Shop of Culture; 4th floor for offices; 38x68 ft.; extended

basement 50x80 ft.; reinforced concrete covered with white tile; black marble base under windows; mezzanine on each floor; roof garden; cost \$60,000; construction to begin Feb. 1.

Tenn., Nashville.—T. S. Regen, Supt., has permit to remodel building at 10th Ave. and railroad at cost of \$5000.

Tenn., Nashville.—Wm. Rich will expend \$5000 to repair burned building; 72x110 ft.; ordinary construction; composition roof; electric lighting; day labor. (Lately noted.)

Tex., Galveston.—Gaston H. Wilder is reported to erect brick business building.

Tex., Galveston.—Galveston Brewing Co., A. L. G. Griffith, Cash., has no definite plans to erect \$25,000 store and apartment building. (Lately noted.)

Tex., San Antonio.—Joe Bolner will erect store on S. Flores St.; cost \$3000.

Tex., Waco.—W. T. Watt will probably let contract in 60 days to erect store, office and hotel. (See Hotels.)

THEATERS

D. C., Washington.—Jos. Dominik has plans for moving-picture theater. (See Warehouses.)

Md., Baltimore.—Cortes Amusement Co. will erect moving-picture theater at Monument St. and Patterson Park Ave.; 1 story; 35x130 ft.; cost \$1950; Raymond Russell, Archt., 238 S. Stricker St., Baltimore. (Lately noted.)

Tenn., Nashville.—Crescent Amusement Co. will expend \$15,000 to remodel motion-picture theater; 25x175 ft.; fireproof; low-pressure steam heat; electric lighting; C. K. Colley, Archt., 33 Life and Casualty Bldg., Nashville; day labor; Lee Davidson, Gen. Supt. (Lately noted.)

WAREHOUSES

Ala., Selma.—Southern Express Co., 71 Broadway, New York, will erect freight warehouse at Union Passenger Station; C. A. Collier, local agent.

D. C., Washington.—Jos. Dominik has plans by S. R. Turner, 432 K St. N. W., Washington, for 2-story warehouse at 1112 7th St. N. W.; cost \$8000; also by same architect for 1-story moving-picture theater on L St. near N. Capitol St.; cost \$3000.

Md., Baltimore.—Enterprise Steam & Hot Water Heating Co., 407 N. Howard St., will erect store and warehouse at 600 N. Howard St. (See Stores.)

N. C., Clinton.—Chamber of Commerce is promoting organization of company to erect cotton warehouse.

N. C., Maysville.—E. H. Morton is reported contemplating erection of cotton warehouse at Belgrade, near Maysville.

N. C., Wilson.—Wilson Cotton Storage Warehouse Co. is being organized to erect cotton warehouse; F. L. Carr, R. J. Grant-ham and R. H. Boswell, Building Com. (Lately noted.)

Tenn., Memphis.—G. T. Taylor will erect warehouse at Tanglewood Ave. and Belt Line; cost \$4000.

Tex., Frost.—W. A. Simms is interested in erecting warehouses; 132x200 ft. and 100x140 ft.; mill construction; iron roof; cost \$5500; day labor. (W. A. Simms lately noted as chairman of committee promoting erection of warehouse.)

Tex., Mt. Vernon.—Warehouse company was organized with \$3000 capital stock; Joe Page, Prest.; C. H. Davis, Secy.; J. M. Parchman, Treas.; will erect cotton warehouse.

Tex., Paris.—Paris Bankers' Assn., Board of Trade and Progressive Club are promoting company to erect cotton warehouse.

Tex., Penelope.—Company organized with J. A. Sullivan, Prest.; S. T. Stovall, V.-P.; L. E. Holloway, Secy., to erect warehouse.

BUILDING CONTRACTS AWARDED

APARTMENT-HOUSES

D. C., Washington.—Geo. H. Buckingham, 2006 N St. N. W., let contract to erect Allendale Apartments at 35th and Lowell Sts. N. W.; 2 stories and attic; cost \$9000; plans by owner.

Mo., St. Louis.—A. Zuckermann let contract to E. C. Fendler, St. Louis, to erect 2-story tenement-house at 3624 Bamberger St.; cost \$4255.

Mo., St. Louis.—E. L. & F. C. Kessler, 2717 Shenandoah St., let contract to F. Zwickl, 1914 Geyer Ave., St. Louis, to erect

2-story apartment-house at 2617-21 Armand Pl.; ordinary construction; composition gravel roof; hot-air heat (6 furnaces) to cost \$500; R. L. Jungling, Archt., 3550 A Nebraska Ave., St. Louis. (Lately noted.)

Tex., Houston.—Frank C. Jones let contract to Buchanan & Gilder, Fort Worth, Dallas and Houston, to erect Morado Apartments at Travis and Webster Sts.; 3 stories; hollow-tile exterior walls; outside finish of Portland cement colored with Stone-Tex; Spanish tile roof; C. W. Bulger & Son, Architects, Praetorian Bldg., Dallas and Houston. (Lately noted.)

ASSOCIATION AND FRATERNAL

Miss. Laurel.—Y. M. C. A. let contract to W. M. Norris, Laurel, to erect building; 126x145 ft.; ordinary construction; tile and composition roof; steam heat; cost \$60,000; Shattuck & Hussey, Architects, 19 S. La Salle St., Chicago. (Lately noted.)

BANK AND OFFICE

D. C., Washington.—McCreary estate, San Francisco, Cal., let contract to erect store and office building. (See Stores.)

N. C., Durham.—First National Bank let contract to Riggs, Distler & Stringer, 23-25 Light St., Baltimore, for plumbing in building estimated to cost \$200,000; Geo. A. Fuller Co., general contractor, Munsey Bldg.; Barber & Ross, steel work contractors, 614 11th St. N. W.; both firms of Washington, D. C.; American Machine Co., heating contractors, Charlotte, N. C.; Milburn, Helster & Co., Architects, 710 14th St. N. W., Washington. (Lately noted.)

Oklahoma City.—Security National Bank let contract to Rhinehart, Donovan & Co., Oklahoma City, to erect building at Main St. and Broadway; 2 stories and basement; gray granite and stone; R. D. Church, Architect, Kansas City, Mo. (Previously noted.)

CHURCHES

Fla., Daytona.—Mt. Bethel Baptist Church, Rev. E. J. Jackson, pastor, let contract to Walton Construction Co., San Antonio, Tex., to erect building; 55x85 ft.; mill construction; Cartwright metal shingle roof; hot-air heat; electric lighting; cost \$10,000; W. A. Rayfield & Co., Architects, Box 649, Birmingham, Ala.

Ky., Murray.—Martin's Chapel let contract to erect church to replace present structure. Address The Pastor.

Va., Portsmouth.—Monumental M. E. Church let contract at \$11,238 to W. F. Hogard to erect Sunday-school building; C. M. Major, Architect, Portsmouth. (Previously noted.)

Va., Princess Anne County.—Old Donation Episcopal Church let contract to C. O. Sherwood to restore building; cost \$3800; J. W. Lee, Architect, Norfolk.

COURTHOUSES

Ga., Alamo.—Wheeler County Commrs. let contract to H. P. Heifner, Atlanta, to erect courthouse; 60x90 ft.; ordinary construction; slate and tile roof; cost \$30,000; E. C. Hooford & Co., Architects, Eastman, Ga.; construction to begin Sept. 20. (Lately noted.)

DWELLINGS

Ala., Birmingham.—Dr. B. J. Anderson let contract to Windham Bros. Construction Co., Birmingham, to erect dwelling; 32x50 ft.; mill construction; furnace heat; electric lighting; cost \$2500; W. A. Rayfield & Co., Architects, Box 649, Birmingham.

Ala., Birmingham.—P. J. Clyde Randall let contract to Roebuck Construction Co. to erect residence; 44x47 ft.; mill construction; furnace heat; cost \$2500; W. A. Rayfield & Co., Architects, Box 649, Birmingham.

Ala., Huntsville.—A. E. Mastin let contract to Baxter Bros., Huntsville, to erect 2 residences; colonial style.

D. C., Washington.—N. C. Gearing let contract to Melton Construction Co., 11th St., Cor. H. N. W., Washington, to erect residence on Clifton Ave.; estimated cost \$9800; N. R. Grinn, Architect, Bond Bldg., Washington.

D. C., Washington.—S. P. Ficklen let contract to John H. Nolan Construction Co., 143 G St. N. W., Washington, to erect 3-story brick dwelling at Biltmore and Chippendale Sts.; cost \$10,000; plans by Clarke Waggaman, 1124 Connecticut Ave. N. W., Washington.

D. C., Washington.—Mrs. E. Zurhorst let contract to M. G. Yost, 902 Pennsylvania Ave. S. E., to erect one-story brick dwelling at 205 3d St. S. E.; cost \$4100; C. C. Dunkle, Architect, 141 Kentucky Ave. S. E., Washington.

D. C., Washington.—E. & McC. Edwards have plans by and let contract to Jesse L. Bunch, 926 Virginia Ave. S. W., to erect two dwellings at 1431 Longfellow St.; 2 stories; brick; cost \$7500.

D. C., Washington.—Mrs. M. M. E. Stentz let contract to Melton Construction Co., 11th St., Cor. H. N. W., Washington, to erect two-story brick dwelling at 328 Mt. Pleasant St.; cost \$6450; plans by Gregg & Leisenring, 1320 New York Ave. N. W., Washington.

D. C., Washington.—Jas. W. Powell, 628 6th St. N. W., has contract to erect 3 dwellings at 3815-19 Randolph St. N. W.; 20x40 ft.; 2 stories and cellar; ordinary construction; tin roof; Gurney Lenox hot-water system of heating; gas and electric lighting; cost \$7500 each; sublets received on plastering, wiring, heating, tin roof, cornice, painting and slate roof.

Fla., Pensacola.—Dr. F. A. Brink let contract to H. A. Goodrich, Pensacola, to erect dwelling; 32x48 ft.; brick walls; frame construction; vulcanite asphalt shingle roof; cost \$3000; W. C. Frederic, Architect, Pensacola. (Lately noted.)

Fla., St. Petersburg.—Mrs. Emile C. Rowland let contract to Frank E. Chase, St. Petersburg, to erect residence; 30x73 ft.; 12 rooms; ordinary construction; stone; Reynolds asphalt shingle roof; craftsman fireplaces; cost \$7000; Geo. W. Stewart, Architect, St. Petersburg.

Fla., Volusia.—T. B. Sullivan let contract to W. S. Havens, Volusia, to erect residence.

Ga., Atlanta.—Mrs. Philip W. Wilcox has plans by and let contract to Chas. Hopson to erect dwelling; 9 rooms; ordinary construction; shingle roof; electric lighting; cost \$8000 to \$10,000.

Ga., Atlanta.—Oscar Pappenheimer let contract to McDaniel & Calmes, Atlanta, to erect residence at 46 Ponce de Leon Ave.; wood and brick; 9 rooms; cost \$10,000.

Ga., Atlanta.—Walter M. Sheets, 61 N. Dargan Pl., let contract to John B. Bowen, Kirkwood, Ga., to erect dwelling; 8 rooms; mill construction; No. 1 colored shingle roof; open grates; electric lighting; cost \$3000. (Lately noted.)

La., New Orleans.—John Stewart let contract to H. Schilling, New Orleans, to erect \$5000 residence; 8 rooms.

Md., Baltimore.—Eugene Greenway let contract to Singer-Pentz Co., 600 Equitable Bldg., Baltimore, to erect residence and garage; brick and frame; slate roof; cost \$25,000; hot-water heat, \$1500; electric lighting, \$600; Edw. L. Palmer, Jr., Architect, Roland Park, Md. (Lately noted.)

Mo., Clayton.—W. K. Stanard let contract to Chas. B. McCormack & Son, Columbia Bldg., St. Louis, to erect brick residence and garage; 92x43 ft.; cost \$36,000; F. C. Honsack, Architect, Pierce Bldg., St. Louis.

Mo., Kinloch.—Kinloch School Dist. let contract to Edw. Holtz, Ferguson, Mo., to erect 2-room brick cottage; cost \$4400.

Mo., Kirkwood.—Craig Realty Co. let contract to Chas. A. Carter, Liggett Bldg., St. Louis, to erect 2 brick stucco dwellings; cost \$7500.

Mo., St. Louis.—A. Mueller let contract to E. Mathelsen, St. Louis, to erect 2-story dwelling at 4015 Wyoming St.; cost \$4500.

Mo., St. Louis.—J. Beckert, Jr., let contract to J. Armbruster, St. Louis, to erect 2-story dwelling at 450 Dover St.; cost \$4000.

Mo., St. Louis.—Sindelar Shoe Co. let contract to erect store and dwelling. (See Stores.)

Mo., St. Louis.—Anheuser Busch Brewing Assn. let contract to erect store and dwelling. (See Stores.)

Mo., St. Louis.—Henry C. Howard let contract to Bush-Burns Realty Co., St. Louis, to erect 7 bungalows on Ashland Ave.

N. C., Charlotte.—Dolph M. Young is reported to have closed contract with J. A. Spencer to erect residence at 506 Morehead St.; 68x82 ft.; 2 stories; 9 rooms; cost \$14,000.

N. C., Charlotte.—S. H. Long is reported to have let contract to Carolina Realty Co., Charlotte, to erect \$3000 residence on Hawthorne lane.

Tex., Brenham.—Dr. T. J. Pier let contract to erect dwelling. (Lately noted.)

Tex., Dallas.—Chas. F. Thomas, 3822 Rawlins St., let contract to A. W. Emerson, Dallas, to erect dwelling; 2 stories; Salmos shingle roof; cost \$4400; G. Plaury, Architect, Dallas. (Lately noted.)

Tex., Edna.—H. C. Coates, Carancahua, Tex., let contract to erect residence in Simon's Addition.

Tex., San Antonio.—J. P. Benkendorfer let contract to Robert F. Uhr, 917 Burnett St., to erect dwelling at Pine and Dakota Sts.; 2 stories; 8 rooms; hollow tile; metal tile roof; cost \$7000; hot-air furnace, \$280; electric lights; Adams & Adams, Architects, 517 Gibbs Bldg., San Antonio. (Lately noted.)

Va., Norfolk.—J. S. Woodhouse, 151 Bank St., let contract to R. H. Gregory, Law Bldg., Norfolk, to erect dwelling; 33 ft. 6 in. wide; slate roof; cost \$7500; Ferguson, Calrow & Taylor, Architects, Royster Bldg., Norfolk. (Lately noted.)

W. Va., Cameron.—Lloyd Strope let contract to Mr. Jones, Moundsville, W. Va., to erect California type bungalow; 8 rooms; cost \$6000.

HOTELS

Fla., Seabreeze.—Henry W. Haynes will expend \$15,000 to erect addition to hotel; 30x40 ft.; frame; first and second stories concrete; tin shingle roof; steam heat; electric lighting; J. McArthur Vance, Architect, Pittsfield, Mass.; contract (lately noted) let to D. F. Fuquay, Daytona Beach, Fla.; heating and plumbing contract, V. C. Grant, Daytona Beach. (See Machinery Wanted.)

W. Va., Clarksburg.—Mrs. A. J. Coleman is having plans prepared by Edw. J. Wood, Lowndes Bldg., Clarksburg, for rooming-house and store, 48 ft. 4 in. by 127 ft. 8 in.; 2 stories and basement; fireproof; Barrett's specification roof; cost \$35,000; contract let to John M. Kisner & Bro. Lumber Co., Fairmont, W. Va.

MISCELLANEOUS

Ga., Atlanta.—Clubhouse.—Atlanta Athletic Club let general contract to R. M. Walker, 712 Grant Bldg., Atlanta, to erect clubhouse; following subcontracts also let: Painting, Tomlinson & Dilschneider; roofing and sheet metal, Warlock Sheet Metal Mfg. Co.; cut limestone and granite, Capital Stone Co.; heating, Engelhart Heating Co.; plumbing, C. W. Baxter; electric work, McGaughey Electric Co.; mill work, Phoenix Planing Mill; all of Atlanta; marble, Kennesaw Marble Co., Marietta, Ga.; Hentz & Reid, Architects, Atlanta. (Lately noted.)

Ky., Glasgow.—Infirmary.—Maplewood Infirmary let contract to Applegate & Co., Glasgow, to erect hospital; 40x60 ft.; ordinary construction; metal roof; hot-water heat; cost \$6500; M. Applegate, Architect, Glasgow. (Lately noted incorporated.)

Tenn., Memphis.—Sheds.—Pioneer Pole & Shaft Co. let contract to J. L. Holly to erect lumber sheds; 210x60 ft.; Carey's roofing; cost \$3000. (Lately noted.)

Tenn., Nashville.—Hospital.—Women's Hospital Board let contract to M. M. Graham & Co., 412 Deaderick St., Nashville, to erect hospital; 56x66 ft.; 5 stories; fireproof; Barrett's specification roof; steam heat; gas and electric lighting; cost \$25,000; C. K. Colley, Architect, 33 Life & Casualty Bldg., Nashville. (Lately noted.)

Va., Fredericksburg.—Stable.—R. G. Hill-drup let contract to E. G. Hefflin, Fredericksburg, to erect stable to replace structure lately noted burned.

RAILWAY STATIONS, SHEDS, ETC.

Ala., Mobile.—Southern Ry. Co., B. Hermon, Ch. Engr., 1300 Pennsylvania Ave., Washington, D. C., let contract to Hancock, Harbin & Hancock, Mobile, to erect freight stations, warehouses and office building; plans include inbound freight house, 40x40 ft.; outbound freight station, 26x40 ft.; one-story freight office, 56x135 ft.; cotton platform, 330x40 ft., to accommodate 1500 bales cotton; storage tracks, scale, chunder-handling plant and tracks for coaling engines; paved driveway on three sides of building; also automobile unloading platform; buildings of steel and brick construction; concrete floors and rolled-steel doors; enlarge yards by team and yard tracks. (Lately noted.)

Fla., St. Petersburg.—Atlantic Coast Line Ry., E. B. Pleasants, Ch. Engr., Wilmington, N. C., let contract to E. W. Parker, Tampa, to erect depot; cost \$70,000. (Lately noted.)

Va., Strasburg Junction.—Baltimore & Ohio R. R., F. L. Stuart, Chief Engr., Baltimore and Charles Sts., Baltimore, Md., let contract to Glaze & Co., Winchester, Va., to erect passenger station. (Previously noted.)

SCHOOLS

Fla., Leesburg.—Leesburg School Dist. let contract at \$24,417 to Dyer & Davis, Tallahassee, to erect school; 75x100 ft.; 2 stories; 12 classrooms; auditorium (separate building) 60x79 ft.; asbestos shingle roof; heating plant to cost \$1900; electric lighting, \$600; W. H. Carr, Architect; subcontracts include steam heat, plumbing, electric lights and fixtures. (Lately noted.)

Fla., Sarasota.—Board of Public Instruction of Manatee county, Bradentown, Fla., let contract to F. H. Andrews to erect school at Palmview; cost \$2328.

Ky., Louisville.—Board of Education let contracts to erect addition to Duncan St. school as follows: Construction, \$47,218, to Thomas & Whitliff, Inc.; heating and ventilating, H. Netherthorpe & Co.; hardware, at \$2785, to Henry Heick Hardware Co.; all of Louisville; structure 12 rooms; composition or Johns-Manville roofing; steam heat to cost \$3000; J. Earl Henry, Architect, Louisville; also directed Saml. D. Jones, business

director, to advertise for bids to erect school at 42d and Herman Sts.; 2 stories; 3 wings; 8 rooms; fireproof; dark-brown tapestry brick with cut stone finish; cost about \$75,000; will have plans prepared by J. Earl Henry for 8-room Emmet Field school on Crescent Hill. (Lately noted.)

Ky., Pineville.—City let contract to Pursell & Cawood, Pineville, to erect school; 18 rooms; brick; cost \$32,000; plans by and construction under supervision of B. F. Graf & Sons, Knoxville, Tenn. (Lately noted.)

Ky., Louisville.—Board of Education will expend \$80,000 to erect school on Flat Lick Road; 80x165 ft.; fireproof; composition roof; washed-air heat to cost \$12,000; Joseph & Joseph, Architects, Great Southern Bldg., Louisville; contract (lately noted) let to L. W. Hancock Co., Louisville.

Md., Frederick.—Hood College is reported to have let contract at \$55,750 to Lloyd C. Culler, Frederick, to erect dormitory; 3 stories; 140x40 ft.; brick; stone trimmings; John B. Hamme, Architect, York, Pa. (Previously noted.)

Md., Ocean City.—Maryland State Teachers' Assn. let contract to W. D. Corddry, Snow Hill, Md., at \$22,800 to erect school; 3 stories; brick; concrete foundation; slate roof; steam heat; electric lights; Theodore Wells Pietsch, Architect, American Bldg., Baltimore. (Lately noted.)

Md., Towson.—Maryland State Normal School Building Com. let contract at \$138,000 to Edward Brady & Sons, 1113 Cathedral St., Baltimore, to erect dormitory; 3 stories; brick and stone; 247 ft. long, with 2 wings, each 83.4 ft. deep; Parker, Thomas & Rice, Architects, Union Trust Bldg., Baltimore.

Miss., Meridian.—City let contracts as follows for improvements to schools: At \$112,540 to T. N. Murray, for painting Highland, Central, East End and Southside schools; \$399,48 to W. E. Rubush, for general work at Highland school; \$2280.48 to Hancock & McArthur, for general work at Stevenson, Central and High schools; \$898.80 to A. P. Pool & Sons, for concrete steps at Central school; \$369.20 to R. O. Dodson, for painting at High school and West End school; \$500 to F. W. McDonald, for carpenter work at East and West End colored schools; \$522.50 to L. M. Shackelford, for painting at East and West End colored schools; \$634 to Standard Construction Co., for painting Wechsler and Tuxedo Park schools.

Mo., Booneville.—School Board let contracts to erect high school as follows: Construction, at \$51,404, to E. B. Cosby Construction Co., Muskogee, Okla.; heating and ventilating, at \$7100, to Booneville Mercantile Co., Booneville; plumbing, at \$3039, to J. H. Wright, Lebanon, Mo.; structure 80x100 ft.; J. H. Felt & Co., Architects, Kansas City, Mo. (Lately noted.)

Mo., Mound City.—Mound City Independent School Dist. let contract to Lincoln Bent, Magnolia, Mo., to erect grade and high school; 157x51 ft. 4 in. with L 33x72 ft.; fireproof; Carey specification roof; cost \$40,000; Trunk & Gordan, Architects, Donnell Ct., St. Joseph, Mo. (Lately noted.)

Mo., Poplar Bluff.—Catholic Church, it is reported, let contract to erect 2-story parochial school; brick; cost \$20,000. Address The Pastor. (Lately noted under Poplar Grove, Mo.)

N. C., Rosehill.—Rosehill Special School Tax Dist. will erect \$10,000 school; brick; H. E. Bonitz, Architect, Wilmington, N. C.; J. W. Elkins, contractor, Fayetteville, N. C.

Okla., Schuler.—City, A. J. Jones, Clerk, let contract to J. F. Hamilton, Vinita, Okla., to erect school; 48x66 ft.; ordinary construction; galvanized-iron roof; hot-air heat; E. Coady, Architect, Okmulgee, Okla. (Previously noted.)

Tenn., Big Sandy.—Big Sandy School Trustees let contract to J. H. Whitney to erect high school and to I. N. Akers for woodwork; cost \$5000. (Lately noted.)

Tenn., Mason.—Tipton County School Board, J. N. Mosely, Chmn. of Building Comm., has plans by and let contract to J. E. Campbell, Jr., Humboldt, Tenn., to erect school building; 48x58 ft.; 2 stories; brick; ordinary construction; galvanized shingle roof; cost \$5000; hot-water heat (separate contract) to cost \$1000. (Lately noted.)

Va., Orange.—Taylor School Dist. let contract to G. W. Allman & Co., Gordonsville, Va., to erect high school; 8 rooms; cost \$3150.

W. Va., Kirkwood.—School Trustees are reported to have let contract at \$48,000 to A. B. Imhoff, Wheeling, W. Va., to erect school.

W. Va., Logan.—Board of Education let contracts as follows to erect 24 schools provided for in \$75,000 bond issue: At \$5300 to

W. M. Patrick to erect Mullen, Beech and Sanders schools; \$3279.50 to V. D. Curry and W. C. Hensley, for Pine and V. D. Curry schools; \$4480, to R. Y. DeJernette, for Foley, Vanceville and Hughey schools; \$3810, to N. E. Steele and Reece Browning, for Thompson, Bob Browning and Chauncey schools; \$3860 to Booth & Ferguson, for Joe Lowe and J. L. Chambers schools; \$2225, to A. A. Stollings, for Coal Branch and Gara Fork; \$1000, to Jas. White, for Mud school; \$1200, to J. K. Browning, for J. A. Justice school; \$1000, to U. S. Coal & Oil Co., for Holden school; \$1650, to J. E. White, for Yuma school; \$1630, to J. E. Ellis, for Cora school; \$1000, to Whitman & Gartin, for Justice addition school; \$1575, to J. D. Hale, for Coal Branch school; \$1599, to J. L. Chaffin, for Holden school; \$850, to R. R. Straton, for Aracoma school. (Lately noted.)

STORES

Ala., Montgomery.—J. Johnson Moore, lessee, let contract to Stuart-Monk Contracting Co., Montgomery, to remodel building; install front, tile floor, etc.; cost \$5000; Okel & Cooper, Architects, Vandiver Bldg., Montgomery.

D. C., Washington.—McCready estate, San Francisco, Cal., let contract to Davis Construction Co., Union Trust Bldg., Washington, to erect store and office building on 14th St.; 2 stories and basement; French design; structural steel and iron, cement and stone, Indiana limestone and brick; concrete cellar floors, walks, steps, copings and footings; lower floor for stores; upper floors, offices; cost \$25,000; Clarke Waggoner, Archt., 1124 Connecticut Ave., Washington.

Mo., St. Louis.—Anheuser Busch Brewing Assn. let contract to Wm. Greenwald, St. Louis, to erect 2-story store and dwelling at 1900-02 Cooper St.; cost \$6500.

Mo., St. Louis.—Sindelar Shoe Co. let contract to H. Schmidt, St. Louis, to erect store and dwelling at 2615 N. 15th St.; cost \$5600.

N. C., Charlotte.—O. B. Robinson is reported to have let contract to Carolina Realty Co., Charlotte, to erect \$10,000 building at 203 Elizabeth Ave.

Tenn., Nashville.—Rucker & Cartwright, Agts., let contract to J. M. Robinson & Co., 514 Broadway, Nashville, to erect store; 22x57 ft.; 2 stories; ordinary construction; Barrett's specification roof; steam heat; gas and electric lighting; cost \$5000; C. K. Colley, Archt., 33 Life & Casualty Bldg., Nashville. (Lately noted.)

Va., Norfolk.—E. L. Myers, Norfolk, has contract to remodel Granby Theater for 3 stores, according to plans by Ferguson, Calrow & Taylor, Norfolk; 2 stories; 19½x100 ft.; front of tapestry brick, white terra-cotta, brass and plate glass; cost \$20,000.

W. Va., Clarksburg.—Mrs. A. J. Coleman let contract to erect store and rooming-house. (See Hotels.)

W. Va., Mannington.—J. F. Adamson, Mannington, prepared plans and has contract to erect business block and apartment buildings; 4 stores on first floor; apartments on second and third floors; 71.9-ft. frontage; concrete foundations; brick and fireproof tile walls; pressed brick and oolite limestone fronts; cost \$30,000. (See Machinery Wanted.)

W. Va., Moundsville.—McMeehan & Riggs will expend \$30,000 to erect wholesale grocery store; 30x120 ft.; mill construction; composition roof; heating not decided; electric elevator (separate contract); M. F. Giesey, Archt., Wheeling, W. Va.; D. T. Burton, Gen. Contr., Moundsville; subcontracts (lately noted) let to Riverside Bridge Co., Wheeling, for iron, and Gatts & Gray, Moundsville, for iron.

THEATERS

Ky., Louisville.—Geo. Alt & Co., 836 Logan St., have contract to erect moving-picture theater on Bonnycastle and Budstown Rd.; 50x130 ft.; fireproof; composition and concrete roof; hot-air heat; cost (without mechanical equipment) \$25,000.

Ky., Louisville.—Fourth Ave. Amusement Co. let contract in June to Geo. Alt & Co., 836 Logan St., Louisville, to erect motion-picture theater; 80x160 ft.; fireproof; composition and concrete roof; steam heat; cost (without mechanical equipment) \$70,000; D. X. Murphy & Bro., Architects, Louisville. (Previously noted.)

Ky., Louisville.—Broadway Amusement Co. let contract to E. Zaepfel to erect theater on Broadway near Shelby St.; 66x150 ft.; concrete roof; cost (without mechanical equipment) \$75,000. (Lately noted.)

Md., Baltimore.—Riggs, Distler & Stringer, 23-25 Light St., Baltimore, have contract at about \$7000 to install steam-heating plant

with fan air washer and ventilating system in Garden Theater, at Park Ave. and Lexington St., for which J. Henry Miller, Inc., Eutaw and Franklin Sts., has general contract; Thos. W. Lamb, Archt., 210 W. Lexington St., Baltimore. (Lately detailed.)

N. C., Laurinburg.—W. D. Tucker, Laurinburg, has contract to erect warehouse; 3 sections, each 50x150 ft., to accommodate 1000 bales cotton; cost \$6700.

WAREHOUSES

Ala., Huntsville.—Lowe Mills let contract to Baxter Bros., Huntsville, to erect warehouse; cost \$12,000.

Md., Baltimore.—Baldwin & Frick, agents, Keyser Bldg., let contract to Cowan Building Co., 106 W. Madison St., to erect additional story to warehouse occupied by McDowell, Pyle & Co. at Charles and Pratt Sts.; cost about \$3000.

RAILROAD CONSTRUCTION

RAILWAYS

Fla., Bradentown.—East & West Coast Ry. Co. has laid 14 mi. of track on its line from Manatee and Bradentown to Arcadia, Fla., 52 mi. Allen W. Jones of Augusta, Ga., and others are interested.

Fla., Jacksonville.—Seaboard Air Line, says a report, will build a spur nearly 2 mi. long from Broward to the north property line of the Carpenter-O'Brien Co. for lumber purposes. W. D. Faucette, Norfolk, Va., is Ch. Engr.

Ga., Savannah.—Southern Seaboard Lumber Co., it is reported, will build railroad from sawmill to timber lands. Arthur F. McArthur is Pres. Construction is begun from near the Ogeechee Canal to Four-Mile Hill, near Savannah. George M. Brinson, formerly president of the Brinson Ry. (now the Savannah & Northwestern), is said to be interested.

La., Donaldsonville.—Walter Ohlmeyer, Plattenville, La., says that the Louisiana Ry., Light & Power Co. is being promoted by him and Dr. H. S. Smith, Albert Boudreaux and Alfred Picot of Thibodeaux, La., to build an interurban electric railway from Donaldsonville to Lockport, La., 56 mi., via Fort Barrow, Belle Alliance, Belle Rose, Klotzville, Painscourtville, Plattenville, Napoleonville, Bertie, Labadieville, Thibodeaux, Lafourche Crossing and Raceland. Purchased rights of way obtained. Surveys, maps, etc., made, also engineer's report. Few bridges. Negotiations in progress with large engineering corporation for construction. Organization not yet formed.

La., New Orleans.—The Orleans-Kenner Interurban Ry. Co. will soon begin construction of a trestle over the Illinois Central R. R. yards. A. Smith Bowman, Kenner, La., is Pres., and H. K. Johnson, New Orleans, is Ch. Engr.

Miss., Beaumont.—Concerning report that plans had been filed for construction of extension from Beaumont to Ansley, Miss., 80 mi., W. F. Owen, receiver, New Orleans, Mobile & Chicago R. R., Mobile, Ala., says it is impossible to state at present when construction will be undertaken.

N. C., Greensboro.—Southern Ry. is reported contemplating enlargement of its freight yards near Pomona. W. H. Wells, Washington, D. C., is Ch. Engr. of Constr.

N. C., Greensboro.—Southern Ry. has awarded contracts for 36 mi. of second track between Greensboro and Pelham, N. C.; Parker Brooks Construction Co. of Greenville, S. C., has from M. P. 248 to 263, and the McGraw Construction Co. of Atlanta, Ga., has from M. P. 263 to 284. W. H. Wells, Washington, D. C., is Ch. Engr. of Construction.

N. C., Kinston.—Concerning report that the Carolina Railroad and the Kinston Carolina Railroad would build extensions, the Carolina Railroad Co. says that no construction will be undertaken until financial conditions improve. Wm. Hayes Kinston is Gen. Supt.

Okla., Beaver.—John L. Love, Okaloosa, Ia., is reported given contract to lay tracks for the Beaver, Meade & Englewood Ry.; also to R. F. Baker of Okaloosa for a pile bridge on main line Beaver to Forgan, Okla., 6½ mi. Frank McKillips, Beaver, is Pres.

Okla., Doby Springs.—Rosston, Grand Rapids & Protection R. R. Co. is organized to build a line from a connection with the Wichita Falls & Northwestern Ry. to Doby Springs, about 12 mi. Line surveyed and bonus of \$24,000 subscribed by Rosston. L. A. Walton is Pres. and Gen. Mgr.; J. H. Butler, Secy., and J. D. Scott, Treas., all of Alva, Okla.

N. C., Charlotte.—Alex Sprunt & Sons, Wilmington, N. C., let contract to Flske-Carter Construction Co., Greenville, S. C., to erect warehouse; 2 stories; 200x110 ft.; each story 15 ft. high; 4 rooms; concrete and brick foundation; brick firewalls; wooden outside walls; capacity 8000 to 10,000 bales cotton; cost \$25,000. (Lately noted.)

Tex., Lancaster.—Lancaster Cotton Warehouse Assn. let contract at \$5892 to Austin Bros., Dallas, to erect warehouse; fireproof; vitrified brick floor; corrugated iron sides and roof; 100x140 ft.; capacity 4000 to 5000 bales of cotton. (Lately noted.)

Tex., McKinney.—Farmers' Bonded Warehouse Co. has plans by and let contract to J. W. Cooper, McKinney, to erect cotton warehouse; 280x100 ft.; ordinary construction; corrugated galvanized iron roof; stoves; electric lights; cost \$5000. (Lately noted.)

S. C., Estill.—Savannah Western R. R. Co. will make survey immediately, according to report from Bowman, quoting G. H. Milligan of Charleston, one of its incorporators, for its proposed line from Estill to St. Paul, S. C., about 90 mi. Bowman has granted right of way and subscribed \$5000.

Tenn., Nashville.—H. H. Mayberry and others, who propose construction of an interurban electric railway to Springfield, Tenn., have asked the Commercial Club to approve the proposition that Davidson county subscribe \$200,000 for the enterprise. Action deferred.

Tex., Castrovilla.—Survey is reported in progress for interurban railway from San Antonio via Castrovilla to Medina Lake. Chamber of Commerce at San Antonio may give information.

Tex., Greenville.—Greenville, Whitewright & Northern Traction Co. has changed its name to Greenville Northwestern Ry. Co., with headquarters at Greenville. Proposed route, which is partly built over, is from Greenville to Merritt in Hunt county, also from Greenville to Blue Ridge, Westminster and Anna in Collin county, and thence to Denton and Gainesville, Tex. A line from Westminster via Whitewright to Bonham is

also planned. A. R. Nicholson, Greenville, is Pres.

Tex., San Antonio.—International & Great Northern R. R. receivers contemplate improvements to the freight yards at San Antonio. Cecil A. Lyon and J. A. Baker, Houston, Tex., are receivers.

Tex., San Marcos.—A syndicate of Eastern capitalists have taken preliminary steps to build a railroad from San Marcos to Luling, Tex., about 20 mi., via Martindale, Fentress and Prairie Lea. Address Commercial Club, San Marcos.

Tex., Walnut Springs.—Glen Rose & Walnut Springs Ry. Co. has graded a 14-mi. line between the two places, and tracklaying is under way from Walnut Springs, with 1 mi. of track down. Sim. Lewis of Waco, J. H. Farr of Walnut Springs and J. P. Lightfoot are interested.

Va., Fredericksburg.—Richmond, Fredericksburg & Potomac R. R. Co., relative to its purchase of the Dannel Hotel property at Fredericksburg, denies press report that it would extend its yard tracks thereon. Property will be held for future use. W. D. Duke, Richmond, Va., is Asst. to Pres.

W. Va., Williamson.—Norfolk & Western Ry. is reported to have let contract to Boley, Haley & Co. of Roanoke, Va., for 1½ mi. line up Blackberry Creek in Pike county, Ky. Line includes bridge over Tug Fork of Big Sandy River. (See Manufacturers Record, May 7.)

STREET RAILWAYS

Fla., Clearwater.—An election is called for the electric railway, light and power franchise granted by the City Council to Chas. H. Evans of Clearwater, J. H. Murphy of St. Petersburg and Dr. H. A. Murphy of Tampa.

Ky., Hopkinsville.—A 20-year street-railway franchise has been sold to R. E. Cooper by the city. He represents capitalists.

Mo., St. Joseph.—St. Joseph Ry., Light, Heat & Power Co. contemplates extension of line on Prospect Ave. from Market to 3d St. J. H. Van Brunt is V. P. and Gen. Mgr.

Tex., Fort Worth.—Northern Texas Traction Co. is reported to have decided to build a 1 mi. extension of Summit Avenue car line. G. H. Clifford is Gen. Mgr.

MACHINERY, PROPOSALS AND SUPPLIES WANTED

Manufacturers and others in need of machinery or supplies of any kind are requested to consult our advertising columns, and if they cannot find just what they wish, if they will send us particulars as to the kind of machinery or supplies needed we will make their wants known free of cost, and in this way secure the attention of manufacturers and dealers throughout the country. The Manufacturers Record has received during the week the following particulars as to machinery and supplies wanted.

"WANTS"

Air Compressor.—See Textile Machinery, Regal Hosiery Mills Co.

Automobiles.—Bernadino Tracheta, General Paz, Buenos Aires, Argentine.—Correspondence with manufacturers of automobiles. (See Manufactured Products.)

Bakery Equipment.—Office of Depot Quartermaster, Jos. T. Davidson, Maj., U. S. Army, Jeffersonville, Ind.—Bids until Sept. 8 to furnish one rear fire bake oven and two dough mixers. Information on application.

Beds (Iron).—See Manufactured Products.

Boat Construction.—U. S. Engr. Office, H. W. Stickle, Maj., Engrs., Wilmington, N. C.—Bids until Sept. 23 to construct motor-survey boat Neuse; information on application.

Boilers.—Southern Equipment Co., 3532 N. 27th St., North Birmingham, Ala.—Water-tube boilers for waste water heat; capacity 150-lb. pressure; good condition.

Bottling Machinery.—Pinellas Abstract Co., 460 Central Ave., St. Petersburg, Fla.—Addresses of manufacturers of quart and pint glass bottles, labels and crimp tops for bottles.

Bridge Construction.—City of Houston, Tex., Ben Campbell, Mayor.—Bids at office City Secy. until Sept. 7 to construct Taylor St. bridge; estimated cost \$12,000; specifications and information obtainable from E. E. Sands, City Engr.

Bridge Construction.—Mayor and Council, Denison, Tex.—Bids until Sept. 7 to construct 6-ft. walkway bridge over M. K. & T. shops; alternate bids for concrete slab flooring and wood-plank flooring; plans on file office of A. B. Clenny, City Engr.

Bridge Construction.—Russell County Commrs., Lebanon, Va.—Bids Sept. 8 to construct steel bridge across Lick Creek; 37 ft. long; steel beam span; cement rubble substructure; blueprints obtainable on application to Childrey Co., Richmond, Va., at 21 cents and postage; G. P. Coleman, State Highway Commr., Richmond.

Bricks.—Malvern German Aluminum Co., Ashland, O.—Bricks for 200x200-ft. saw-tooth-construction building.

Bridge Construction.—Bell County Commrs., J. H. Bailey, County Road Engr., Pineville, Ky.—Bids until Sept. 11 to construct concrete masonry for wagon bridge across Cumberland River; about 200 ft.

Building Materials.—J. F. Adamson, Mannington, W. Va.—Prices on brick, fireproofing, lumber, plumbing, electric wiring, 1 beams, channels, etc., for \$30,000 store and apartment building.

Car.—Navy Dept., Bureau Supplies and Accounts, Saml. McGowan, Paymaster-Gen., Washington, D. C.—Bids Sept. 22 to furnish standard steel flat car wooden floor, capacity 60,000 lbs., for 8½-in. gauge track, schedule 7238; delivery Washington; for schedules apply to navy pay office nearest navy-yard.

Castings.—See Flow Manufacture, Herndon Plow Co.

Chemical Products.—See Machinery, etc., B. Madert, Tangier, Morocco, Africa.

Cranes (Locomotive).—Navy Dept., Bureau of Yards and Docks, H. R. Stanford, Chief, Washington, D. C.—Bids until Sept. 23 for three 15-ton locomotives for Navy-yard, Philadelphia; also 15-ton locomotive crane for Navy-yard, Charleston, S. C.;

specifications (No. 3094) obtainable on application to bureau or to commandants of navy-yards named.

Crate Material.—Arch Creek Packing Co., Wm. Bennett, Prest., Arch Creek, Fla.—Prices on crate material.

Cylinders (Deep Well).—Independent Ice Co., 2d and Campbell Sts., Wilmington, N. C.—Steam-head 10x36-in. cylinder for deep well.

Drainage Construction.—Drainage Commrs., Fort Bend County Drainage Dist. No. 1, B. A. Everts, Chrmn., Clodine, Tex.—Bids until Sept. 12 to improve drainage district; maps, plats and specifications on file with Clifton Rice, Engr., Richmond, Tex.

Duck (Cotton).—Office of Depot Quartermaster, Thos. Cruise, Col., 26th St. and Gray's Ferry Rd., Philadelphia, Pa.—Bids until Sept. 3 to furnish under proposal No. 50 25,000 yds. olive drab duck and 40,000 yds. olive drab cotton webbing. Information on application.

Electric-light Plant.—See Water-works, Electric-light Plant and Sewers, Geo. West.

Electrical Equipment.—Navy Dept., Bureau Supplies and Accounts, Saml. McGowan, Paymaster-Gen., Washington, D. C.—Bids Sept. 22 to furnish 3000 ft. interior communication cable, 4-conductor; 255,000 ft. double plain insulated flexible cable; 1400 key sockets for 3/4-in. pipe; 300 fiber-lined keyless sockets, 1/4-in. cap; 9500 ft. twin-conductor, leaded and armored, soft steel, galvanized wire, 60,000 C. M., schedule 7271; 11,000 ft. interior communication leaded and armored, soft steel, galvanized cable, schedule 7257; 320 special supporting porcelain insulators, schedule 7252; 77,600 ft. lighting and power rubber insulated wire for 600 volts or less, schedule 7270; delivery Brooklyn, N. Y.; for schedules apply to navy pay office nearest navy-yard.

Electrical Machinery.—Electrical Supply Co., 125 Camp St., New Orleans, La.—Alternating-current motor; 40 H. P., 60-cycle, single-phase.

Electrical Machinery.—Postoffice Department, Office of J. A. Edgerton, Purchasing Agent, Washington, D. C.—Bids until Aug. 31 to furnish 2 motors, 1/2 H. P., vertical direct current. Information on application.

Electrical Machinery.—R. A. Brown Construction Co., Concord, N. C.—To rent 50 H. P. motor for 60 or 90 days; form "K," 500 R. P. M., 2300 volts, 60-cycle, 3-phase, 12x12-in. pulley, complete with base and starting apparatus. (Lately incompletely noted.)

Elevators.—Luray Ice Co., Luray, Va.—Three elevators, to be operated by electric power, rate of 100 ft. per min.; also equipped with hand-power attachment for any required use, and to operate at not less than 20 ft. per min.; reasonable rope pull, electric current, 3-phase, 60-cycle, 220-volt, one platform 4x4 ft., to travel 35 ft., capacity 1000 lbs.; one of 8x10 ft., travel 25 ft., capacity 4000 lbs.; one of 5 ft., 2x7 ft. 8, travel 25 ft., capacity 2000 lbs.

Elevator.—Treasury Dept., Office of Oscar Wenderoth, Supervising Archt., Washington, D. C.—Bids until Sept. 29 to furnish complete electric passenger elevator in U. S. postoffice at Muskogee, Okla., in accordance with drawings and specifications, copies of which are obtainable on application at this office at discretion of Supervising Archt.

Engine (Corliss).—Wm. S. Whiting, American National Bank Bldg., Asheville, N. C.—Second-hand 125 H. P. Corliss engine; good condition; delivery Elizabethton, Tenn.

Engine (Corliss).—Stevenson Cotton Mills, Stevenson, Ala.—Corliss engine of 200 to 250 H. P. capacity; wants addresses of builders of these engines.

Engines (Steering).—Navy Dept., Bureau Supplies and Accounts, Saml. McGowan, Paymaster-Gen., Washington, D. C.—Bids Sept. 22 to furnish 2 steering engines, 3/4x3/4 in., for steam steering only, schedule 7239; delivery Norfolk, Va.; for schedules apply to navy pay office nearest navy-yard.

Engines (Gasoline, Stationary and Marine).—Memphis Cotton Exchange, Henry Hotter, Secy., Memphis, Tenn.—Addresses of manufacturers of stationary and marine gasoline engines.

Excavator.—Yancy & Johnson, Box 180, Paducah, Ky.—Prices on excavator to dig ditch for 10-ft. sewer.

Fire Apparatus.—Mayor and Board of Commrs., Gulfport, Miss.—In session Sept. 17 to consider fire-fighting trucks and apparatus; view to purchase one or more; manufacturers requested to have representative present.

Fire Station Equipment.—Jas. F. Gause, Jr., Wilmington, N. C.—Catalogues and prices on equipment of all kinds for fire stations.

Fireplace Equipment.—D. F. Fuquay, Daytona Beach, Fla.—Prices on cast-iron throat and damper for fireplace and 12x16-in. fire-clay flue lining.

Fireproofing.—See Building Materials, J. F. Adamson.

Grading.—Orange County Good Roads Com., R. T. Brown, Engr., Hillsboro, N. C.—Bids Sept. 14 to grade 5 mi. road. Information at office of engineer.

Hardware, etc.—Navy Dept., Bureau Supplies and Accounts, Saml. McGowan, Paymaster-Gen., Washington, D. C.—Bids Sept. 22 to furnish miscellaneous lot track bolts, railroad spikes and lock-nut washers, schedule 7249; delivery Washington; miscellaneous lot wire brads, copper chain and screw eyes; 26 reams emery and crocus cloth; hasps and hinges; 138 chest, door and drawer locks; 380 bronze padlocks; 40 reams garnet paper, 9x11 in., Nos. 00, 0, 1/4, 1/2 and 3/4; punches, hinges, nails, grommet and key rings, schedule 7256; miscellaneous lot wood, brass and iron screws, flat and round head, schedule 7250; delivery Norfolk, Va.; for schedules apply to navy pay office nearest navy-yard.

Heating System, etc.—Oklahoma State Board of Agriculture, Benj. Heanessy, Secy., Oklahoma City, Okla.—Bids until Oct. 1 to extend heating, water and sewer and plumbing systems at Panhandle Agricultural Institute; heating system, including all buildings heated, to be under vacuum-vapor gravity return system, etc.; water system improvements to include 6000-gal. steel tank with cover, manhole and ladder on 30-ft. steel tower on concrete foundation, etc.; sewer improvements to include 6-in. pipe from septic tank to shop building and to girls' dormitory, septic tank, etc.; plumbing improvements to include 2 lavatories, 2 shower baths, etc.

Hog.—Hosball, Simmons & Co., 90 S. Front St., Memphis, Tenn.—Second-hand veneer hog; Mitts & Merrill, Capitol or other good make; state price, condition, size, etc.

Hose.—Navy Dept., Bureau Supplies and Accounts, Saml. McGowan, Paymaster-Gen., Washington, D. C.—Bids Sept. 29 to furnish 11,500 ft. rubber-lined cotton hose, 3/4 in., 50-ft. lengths, without couplings, schedule 7247; delivery Boston, Philadelphia and Norfolk; 31,200 ft. air hose, 10, 25 and 50-ft. lengths, schedule 7247; delivery Portsmouth, Boston, Philadelphia and Norfolk; for schedules apply to navy pay office nearest navy-yard.

Hospital Equipment.—Special Hospital Building Com. of City Council, Augusta, Ga.—Bids until Sept. 25 (extended time) to furnish and equip University Hospitals at Augusta with following: Iron beds, mattresses and pillows; aseptic steel furniture; linens, blankets, sheets, towels and rubber sheets; china and glassware; silverware and cutlery; wood furniture, rugs, shades, etc.; surgical instruments; X-ray apparatus; specifications obtainable on application to W. C. Lyle, M.D., Vice-Dean, Augusta; bids (specific) received for separate items, combination of items, or on whole.

Ice-cream Machinery.—Peter L. McDonough, 112 Jackson St., Albany, Ga.—Data and prices on equipment for ice-cream factory.

Laundry Machinery.—See Manufactured Products.

Laundry Machinery.—A. B. Roane, 425 King St., Portsmouth, Va.—Catalogues with discount sheets on laundry machinery, equipment and supplies.

Levee Construction.—Milam County Improvement Dist., John Hicks, Mgr., Rockdale, Tex.—Bids until Sept. 25 to construct dirt levee on Little River; 61,067.24 cu. yds.; 5 3-10 mi. long; plans and specifications on file.

Levee Construction.—Board of Commissioners, Memphis, Tenn.—Bids at office of C. C. Pashby, City Clerk, until Sept. 2 to furnish labor, tools, hauling for and materials (except those especially designated), and construction of following: Concrete walls for North Memphis levee; 1500 cu. yds. No. 1 reinforced gravel concrete for counterfort type wall; 250 cu. yds. No. 1 reinforced gravel concrete for core type wall; 250 cu. yds. excavation; alternative proposal, same amounts reinforced stone concrete; amounts approximate; steel has been purchased and will be supplied contractor at \$1425 base f. o. b. cars Memphis; specifications, etc., at office of City Engr.

Lighting Fixtures.—Treasury Dept., Office of Oscar Wenderoth, Supervising Archt., Washington, D. C.—Bids until Sept. 21 to install light fixtures in U. S. public buildings at Minneapolis, Muskogee (Okla.), Boston and San Francisco. Information on application.

Lighting System (Gasoline or Acetylene).—Continental Coal Corp., F. M. Meadows, Purchasing Agent, Straight Creek, Ky.—Gasoline or acetylene lighting system for Arjay commissary. Send data, cuts and prices.

Lumber.—Navy Dept., Bureau Supplies and Accounts, Saml. McGowan, Paymaster-Gen., Washington, D. C.—Bids Sept. 22 to furnish 20,000 ft. crossing plank oak, 4x10 in., by 16 ft. long, schedule 7259; 16,000 ft. No. 1 white pine, firsts and seconds, 2 1/2x10 in. and 3x10 in. up wide; 45,000 ft. Virginia pine, 1 and 3 in. by 12 in. by 12 to 16 ft. long; 20,000 ft. Southern spruce, dressing 1 1/2 and 2 in., 10 to 12 in., schedule 7258; delivery Washington; 45,000 ft. merchantable Southern spruce; 30,000 ft. No. 2 white pine, well seasoned, 2 1/4, 2 1/2 and 3 in.; 225,000 ft. Nos. 1 and 2 North Carolina pine; 165,000 ft. prime well-seasoned yellow pine, schedule 7258; delivery Norfolk.

Machinery, etc.—B. Madert, Ave. du College, Pres. du College Francais, Tangier, Morocco, Africa.—Interested in "chemical products, concerning construction of buildings, industries, etc., machines of all kinds;" view to agencies; desires correspondence with manufacturers and shipping companies.

Manufactured Products.—Bernadino Iracheta, General Paz, Buenos Aires, Argentine.—Correspondence with manufacturers of following: 2 double iron beds, 2 double iron beds each for 1 1/2 and 1; 1 doz. regular Vienna chairs; 5 doz. imitation Vienna chairs; 2 cases syringes for ordinary use; 2 hominy machines; machine for crushing corn for poultry; 2 automobiles; equipment for laundry purposes; 7 pieces (will furnish samples) cotton duck; rope; 500 kilos thread (furnish samples); 25 kilos of finer thread; 200 doz. soles for shoes (Alfargata).

Metals.—Navy Dept., Bureau Supplies and Accounts, Saml. McGowan, Paymaster-Gen., Washington, D. C.—Bids Sept. 22 to furnish 3100 lbs. cold and soft-rolled sheathing copper and 5200 lbs. flat medium bar steel, commercial lengths, schedule 7262; delivery Charleston, S. C.; for schedules apply to navy pay office nearest navy-yard.

Mill Work.—Dept. of Justice, Office of F. H. Duehay, Supt., Washington, D. C.—Sealed proposals until Sept. 29 for furnishing and delivering at U. S. Penitentiary, Atlanta, Ga., mill work for hospital building; specifications, etc., upon application.

Mining and Milling Machinery.—W. C. Ross Mfg. Co., Little Rock, Ark.—Prices from manufacturers on complete equipment for tripoli mills and mining plant; daily capacity about 30 to 50 tons.

Mixing (Fertilizer) Machinery.—R. W. Storrs, De Funak Springs, Fla.—Prices on fertilizer mixing machinery for small plant.

Mixer.—Willard E. Simpson, 208 Washer Bldg., San Antonio, Tex.—Prices on second-hand mixer with side loader. (Little Wonder preferred.)

Paint (Wood Preservative).—T. C. McCampbell, Purchasing Agent, Tennessee, Kentucky & Northern R. R. Co., Nashville, Tenn.—Data and prices on wood preservative paint for wooden railway bridge stringers, fence-posts, etc.

Paper-Bag Manufacture and Machinery.—W. M. Canty, Pascagoula, Miss.—Data on manufacture of paper bags and prices on machinery.

Paper (Wrapping).—Arch Creek Packing Co., Wm. Bennett, Prest., Arch Creek, Fla.—Prices on vegetable wrapping paper.

Paper.—Navy Dept., Bureau Supplies and Accounts, Saml. McGowan, Paymaster-Gen., Washington, D. C.—Bids Sept. 22 to furnish 10,000 lbs. white paper for blueprint coating, thin and medium, 30 and 36-in. wide, schedule 7255; delivery Washington; for schedules apply to navy pay office nearest navy-yard.

Paving, etc.—Jackson County Commrs., J. E. Gammon, Chrmn. of Board, Marianna, Fla.—Bids until Sept. 8 to construct and complete cement wall and walk around courthouse square; plans and specifications at office of Clerk of Court.

Paving.—Board of Public Works, Harold G. McGrath, Secy., Louisville, Ky.—Bids until Sept. 8 to pave sidewalks on portions of 41st, Market, Preston and Rupp Sts., according to ordinances 236, 237, 238, 245 and 250 of series 1914.

Paving.—City, J. T. Parsons, City Clerk, Salisbury, Md.—Bids until Sept. 7 to construct 12,500 sq. yds. vitrified brick, bituminous concrete or bitulithic pavement on 5-in. concrete base; P. S. Shockley, Engr.

Paving.—City, Chas. E. Bolling, City Engr., Richmond, Va.—Bids until Sept. 15

to grade and gravel certain streets, place granolithic curbing and guttering, lay granite spall paving, 113,000 sq. yds. smooth paving and 6000 sq. yds. granite block; specifications and proposal forms obtainable from City Engr.

Paving.—E. B. Cline, City Auditor, Tulsa, Okla.—Bids until Sept. 10 to pave portions of Norfolk Ave. and 3d St.

Pipe.—City of Huntingdon, Tenn., A. M. Lee, Mayor.—Bids on water-pipe supplies.

Piping, etc.—City of Savannah, Ga.—Bids until Sept. 1 to furnish 7290 ft. 6-in., 2538 ft. 8-in. pipe, 7700 lbs. special fittings and 8000 lbs. lead; class "B" bell and spigot pipe required, and same with fittings to be in accordance with standard specifications of American Water-works Association, f. o. b. Savannah; further information on application to E. R. Conant, Purchasing Officer.

Plow Manufacture.—Herndon Plow Co., F. C. McCormick, Prest., Laurinburg, N. C.—Correspondence with founders and machinists (especially in vicinity of York, Pa., and Baltimore, Md.) relative to manufacture of plow with steel beam (cast) and other parts complete.

Plumbing.—See Heating System, etc.

Potato-Chip Machinery.—Peter L. McDonough, 112 Jackson St., Albany, Ga.—Data and prices on equipment for Irish potato-chip factory.

Presses (Baling).—I. C. Seymour, 5117 Kenwood Ave., Chicago, Ill.—Steel power baling presses; belt or geared; second-hand Minnich preferred.

Printing (Multiple Typewriting) Machinery.—Commercial Club, P. O. Aiken, Secy., First National Bank Bldg., Lake Charles, La.—Addresses of manufacturers of multiple typewriting printing machines; do not want mimeographs.

Quay Wall.—Navy Dept., Bureau Yards and Docks, H. R. Stanford, Chief of Bureau, Washington, D. C.—Bids until Sept. 19 for pile and lumber work in reconstructing quay wall at Navy-yard, Mare Island, Cal. Information on application.

Radio Building, etc.—Navy Dept., Bureau of Yards and Docks, H. R. Stanford, Chief, Washington, D. C.—Bids until Oct. 10 for radio building of concrete construction, and operators' quarters of wood construction, at U. S. Naval Radio Station, San Juan, P. R.; plans and specifications on application to bureau or to naval station named.

Recorder.—Navy Dept., Bureau Supplies and Accounts, Saml. McGowan, Paymaster-Gen., Washington, D. C.—Bids Sept. 22 to furnish quadruplex CO2 recorder with four auxiliary boiler-room indicators, schedule 7242; delivery Charleston, S. C.; for schedules apply to navy pay office nearest navy-yard.

Refrigerating Equipment.—Engineer Depot, Jos. E. Kuhn, Lieut.-Col., Washington Barracks, D. C.—Bids until Sept. 23 to furnish refrigerating apparatus having capacity of 6 tons of refrigeration in 24 hrs. Information on application.

Reservoir (Concrete).—J. Dock Harrell, City Clerk, McComb City, Miss.—Bids until Sept. 29 to construct concrete reservoir; plans and specifications office Xavier A. Kramer, Engr., Magnolia, Miss.

Retaining Wall.—Board of Affairs, J. F. Bedell, Prest., Charleston, W. Va.—Bids until Sept. 19 to construct concrete retaining wall along levee; about 7400 lin. ft. piling and 2230 cu. yds. concrete masonry; plans and specifications at office of G. S. Brown, City Engr., Loewenstein Bldg., Charleston.

Road Construction.—Alcorn County Commrs., Corinth, Miss.—Bids until Sept. 9 for constructing improved highways; Engr., Gus E. Hauser, Jr., Aberdeen, Miss.

Road Roller.—L. F. Hobbs, Box 483, Norfolk, Va.—Prices on modern 10-ton, 3-wheel, steam road roller for resale; good condition; state shop number, age, time used, point of inspection, etc., first letter.

Road and Street Work.—Hancock County Supervisors, Bay St. Louis, Miss.—Bids until Sept. 7 for maintenance State and county roads; about 250 mi.; contractor to bond for double amount of bid and be under supervision of members of boards of respective bents; county to maintain bridges and waterways; A. A. Kergosien, Clerk.

Rope.—See Manufactured Products.

Sand.—Malwurm German Aluminum Co., Ashland, O.—Sand for use in construction of 20x200-ft. sawtooth-construction building.

Seating.—See Manufactured Products.

Sewers.—See Water-works, Electric-light Plant and Sewers, George West.

Sewers.—Board of Public Works, Allen Thomas, Clerk, Tampa, Fla.—Bids until Sept. 1 to construct sewers and appurtenances at De Soto Point, Section 10, on Elmwood and Maple Sts., and Oakwood Ave. between 20th and 22d Sts.; about 1700 ft. 8-in. tile, with 66 "Y" branches excavation less than 8 ft., 5 manholes less than 8 ft. deep.

Sewers.—Dist. Commrs., 509 Dist. Bldg., Washington, D. C.—Bids until Sept. 8 to construct 6250 lin. ft. pipe sewers, 12 in. to 24 in. diam. Information on application to Chief Clerk, 427 Dist. Bldg.

Sewer Construction.—See Heating System, etc.

Sewer Construction.—City, Chas. E. Bolling, City Engr., Richmond, Va.—Bids until Sept. 17 to construct brick and terra-cotta pipe sewers in northeast section of city; specifications and proposal forms obtainable from office City Engr.

Sewer Construction.—Board of Commissioners, City Hall, Tulsa, Okla.—Bids until Sept. 10 at office City Auditor to construct sanitary sewer system; plans, profiles and specifications on file with T. C. Hughes, City Engr.

Steam Shovel.—J. S. Beckwith, 108 W. Parkway, N. S., Pittsburgh, Pa.—Small steam shovel; full circle, traction; state age, shop number, condition, make, size, etc.

Steel.—Malwurm German Aluminum Co., Ashland, O.—Steel for construction of 200x 200-ft. sawtooth-construction building.

Steel Angles, etc.—Panama Canal, F. C. Boggs, Gen. Purchasing Officer, Washington, D. C.—Bids until Sept. 14 to furnish steel angles, plates, I beams and channels, cold-rolled steel, tool steel, frogs, point switches, steel rails, track bolts, tie-plates, nut locks, bolts, nuts, rivets, boat spikes, washers, reamers, pipe cutters, files, nails, wire rope, chain, locomotive tires, brass nuts and screws, corrugated roofing, bronze, paint brushes, whitewash brushes, water coolers, cardboard, paper, sandpaper, manganese dioxide, potassium chlorate and switch ties; blanks and general information relating to this circular (No. 867) may be obtained from this office or offices of assistant purchasing agents, 24 State St., New York; 614 Whitney-Central Bldg., New Orleans; and 1066 North Point St., San Francisco; also from U. S. Engr. offices in Seattle, Los Angeles, Baltimore, Philadelphia, Pittsburgh, Boston, Buffalo, Cleveland, Cincinnati, Chicago, St. Louis, Detroit, Milwaukee, St. Paul, Chattanooga, Louisville, Mobile and Galveston; Commercial Club, Kansas City, Mo.; Chamber of Commerce, Quincy, Ill., and Commercial Club, Tacoma, Wash.

Steel Beams, etc.—F. F. Cherry, Aurora, N. C.—Prices on steel I beams and round cast columns for store and hotel building.

Textiles.—See Manufactured Products.

Textile Machinery.—Regal Hosiery Mills Co., Cameron, N. C.—Prices on twist-ers and winders; also on 15 or 20 H. P. air engine (good second-hand Wier or Muncie preferred.)

Trucks.—See Fire Apparatus, Gulfport, Miss.

Tubes.—Navy Dept., Bureau Supplies and Accounts, Saml. McGowan, Paymaster-Gen., Washington, D. C.—Bids Sept. 22 to furnish 200 iron boiler tubes, 4-in. diam., 18 ft. long, schedule 7254; delivery Washington, D. C.; for schedules apply to navy pay office nearest navy-yard.

Typewriter Repairs and Accessories.—J. L. Roark estate, Orien L. Roark, Mgr., Greenville, Ky.—Catalogues and trade lists of typewriter repairs and accessories.

Water-works.—See Heating System, etc.

Water-works.—City of Leesburg, Va.—Bids until Sept. 8 for altering and improving water system. Address E. L. Pleasants.

Water-works.—City of Vicksburg, Miss. Bids until Sept. 21 to construct for water-works construction and equipment to include: 1,000,000-gal. coagulating basin; 500,000-gal. clear-water basin; 3,000,000-gal. filter; pumping station, pump pit and intake tower; 132 tons 4-in., 1290 tons 6-in., 450 tons 8-in., 180 tons 10-in., 643 tons 12-in., 700 tons 16-in. and 10 tons 20-in. C. I. pipe; 55 tons 10 to 20-in. flanged C. I. pipe and 5 tons flanged special castings; 253 fire hydrants; 3 horizontal tube boilers, 200 H. P.; high-pressure pumps of combined steam turbine and centrifugal pump units, horizontal shaft, each with condenser and each 3,000,000 gals. daily capacity; 3 extension furnaces; 5-ton 46-ft. span hand-operating traveling crane; filters in 4 units, each 14½x17½ ft. inside dimensions and open at top, giving total filter surface 1085 sq. ft.; 2 concrete tanks and 2 concrete iron solution tanks; excavation and drainage, coal chute, filters and basins,

etc.; cost \$300,000 to \$400,000; A. L. Dabney, Engr., Memphis, Tenn.

Water-works, Electric-light Plant and Sewers.—Geo. West of George West, Live Oak County, Tex.—Bids until Sept. 10 at office of Bartlett & Ranney, Inc., Consult. Engrs., San Antonio, Tex., to construct water-works, electric-light plant and sewer system; plans and specifications at office Engrs.

FINANCIAL NEWS

FINANCIAL CORPORATIONS

Ala., Red Level.—People's Bank of Red Level, a new concern, is chartered and began business Aug. 18; capital \$25,000. J. M. Foshee, J. L. Foshee and R. H. Foshee, all of Cohasset, Ala., are interested.

Ala., Tuskegee.—Farmers' State Bank has begun business; capital \$50,000. Francis L. Wadsworth is Pres.; Frank M. Johnston, V.-P.; Lewtie C. Johnston, Cash.

Ark., Fort Smith.—Security Investment Co., a new concern, is incorporated with \$60,000 capital. It is a holding company. Incorporators: T. W. N. Boone, P. A. Ball and A. S. Dowd.

Ark., Greenwood.—Sebastian State Bank, capital \$20,000, with \$2000 surplus, will begin business about Sept. 1; County Judge Ezra Hester, Pres.; T. A. Norris, V.-P., and W. C. Davis, Cash.

Ga., Savannah.—Appraisal Co. of the South is chartered; capital \$10,000; incorporators, Wayne Cunningham, Charles Neville and H. W. Johnson.

Ky., Annville.—A new bank has been organized with R. B. Mullins of Swinging, Cash.

Ky., Louisville.—Commercial Union Adjustment Co., Louisville Trust Bldg., capital \$2000, is inceptd. and will begin business immediately. C. J. Roberts is Pres.; F. J. Engler, V.-P.; R. R. Williams, Secy. and Treas., and Clarence Longacre, general counsel.

La., Cherokee.—Security National Bank of Cherokee has made application to organize; capital \$50,000.

Md., Ocean City.—State Bank of Ocean City, capital \$10,000, has been organized thus: J. S. Mumford, Pres.; John M. Mumford, Cash.; Lemuel Wyatt, Harry J. Cropper and Henry Yewell Brady.

Mo., Golden City.—Golden City National Bank is inceptd.; capital \$25,000; surplus \$4000; H. H. Steele, Pres.; C. W. Sheppard and W. R. Crowther, V.-Ps.; J. P. Meyers, Cash.; E. Myers, Asst. Cash. Business is to begin in about 10 days. This is a change from the Golden City Banking Co.

N. C., Jefferson.—V. E. Ballou of Grassy Creek, N. C., denies recent press report that he was organizing a State bank at Jefferson. There is no truth in it.

N. C., Lumberton.—National Bank of Lumberton, capital \$100,000, surplus \$20,000 and undivided profits of \$10,000, which has applied for charter, succeeds the Bank of Lumberton. No change in officers or directors. A. W. McLean, Pres.; C. B. Townsend, active V.-P.; R. D. Caldwell and A. E. White, V.-Ps.; C. V. Brown, Cash.

N. C., Raleigh.—American Collection and Rating Bureau is chartered; capital \$100,000; incorporators, Edward Adams, Sr., Edward Adams, Jr., C. K. Burgess.

N. C., Rocky Mount.—The conversion of the Planters' Bank into the Planters' National Bank is approved; capital \$100,000.

Okla., Oklahoma City.—Lawyers' Trust Co., capital stock \$5000, is chartered. Incorporators, James S. Gladish, M. L. Gladish and M. L. Scales of Oklahoma City.

Tenn., Knoxville.—Fidelity Trust Co., \$100,000 capital, will soon begin business with J. Allen Smith, Pres.; M. D. Arnold, Joseph P. Gaut and Frank M. Haynes, V.-Ps., and M. D. Arnold, Jr., Secy.-Treas.

Tex., El Paso.—Border City Investment Co. inceptd. and chartered; capital \$5000; C. L. Sirmans, Pres.; H. L. Stevens, V.-P.; C. L. Wolfe, Secy.-Treas. Business Began Sept. 1.

Tex., Paradise.—Paradise State Bank is authorized to do business; capital \$10,000.

Va., Bedford City.—Citizens' National Bank, capital \$50,000, will begin business Oct. 1; S. S. Lambeth, Jr., Pres.; J. A. Clark, V.-P.; R. E. White, Cash.; R. Q. Lowry, Asst. Cash.

Va., Gloucester.—First National Bank of Gloucester is approved; capital \$35,000; organizers, R. P. Gray of Sign Pine, Va.; C. G. Hinkle, L. M. von Schilling, H. R. Booker and L. M. Newcomb.

Va., Willis.—Blue Ridge Bank of Willis is

chartered; capital stock \$25,000; minimum \$15,000. C. K. Burnett, Pres.; S. C. Slusher, Secy. and Cash.; G. W. Agnew and others are incorporators.

Va., Willis.—Blue Ridge Bank inceptd., capital \$20,000; will begin business in about 2 months; Chas. K. Burnett, Pres.; Wm. J. Phillips, V.-P.; S. C. Slusher, Cash.; directors, J. H. Terry, W. G. Donnelly, Eli Wade, S. W. Hylten and A. N. Hylton.

NEW SECURITIES

Ala., Andalusia.—A second issue of school-building bonds is reported voted. Address The Mayor.

Ala., Carrollton.—\$1600 6 per cent. 10-year school improvement bonds have been voted. Address The Mayor.

Ark., Texarkana.—No sale was made Aug. 26 of \$40,000 5½ per cent. Nix Creek Drainage Dist. (Miller county) bonds; dated Sept. 1, 1914; maturity to suit purchaser, but serially for 20 years. L. Kirkland is Chrmn. County Commissioners.

Fla., Clearwater.—\$75,000 of 5 per cent. 30-year bonds to be voted upon Oct. 6 are for sundry improvements; denomination \$500. J. R. Jeffords is Mayor.

Fla., Dade City.—\$4000 of 6 per cent. school-building bonds, District No. 4, of Pasco county are reported voted. Address County Commissioners.

Fla., Fort Meade.—\$22,000 8 per cent. 1-3-year sidewalk improvement certificates are being offered. Address First National Bank. Further particulars will be found in the advertising columns.

Fla., Fort Meade.—\$57,500 of Municipal bonds are reported voted thus: \$25,000 electric-light plant, \$25,000 street improvement, \$7500 water-works and sewer; \$7000 municipal building bonds were defeated. M. A. Wilson is Mayor.

Fla., Green Cove Springs.—All bids received Aug. 3 for \$150,000 5½ per cent. 40-year Clay county road and bridge Dist. No. 1 bonds were rejected. M. W. Griffiths is Clerk Circuit Court.

Fla., Homestead.—Proposed to issue bonds for paving, sewers, water and lights, and Legislature will be asked to authorize up to \$50,000 as may be required. Address The Mayor.

Fla., Lake City.—No satisfactory bids were received Aug. 24 for \$79,000 5 per cent. 30-year improvement bonds. G. A. Bule is Chrmn. Board of Public Works.

Fla., Lake City.—No sale was made Aug. 24, it is reported, of the \$79,000 of 5 per cent. 30-year validated redemption and improvement bonds. Address G. A. Bule, Chrmn. Board of Public Works.

Fla., Macclenny.—It is proposed to hold an election on electric-light and water bonds. Address The Mayor.

Fla., Miami.—Bids will be received until noon Sept. 15 for \$55,000 of 6 per cent. Dade county school bonds. Address R. E. Hall, Secy. Board of Public Instruction.

Fla., Pablo Beach.—Election Sept. 15 on \$35,000 of 6 per cent. 30-year sewerage and electric-light bonds and five bond trustees. Address C. F. Rockett, Mayor.

Fla., Tampa.—Bids are invited until noon Sept. 16 for \$500,000 of 5 per cent. 30-year, optional, road bonds of Hillsborough county; denomination \$1000. Bids must be at least 95 and interest. Address W. P. Culbreath, Clerk to County Commrs. Further particulars will be found in the advertising columns.

Fla., West Palm Beach.—Bids for \$10,000 of 6 per cent. \$500 bonds of School Dist. No. 7 of Palm Beach county are invited until Sept. 14. H. W. Lewis is Supt. Public Instruction.

Ga., Albany.—The proposed issue of \$50,000 of Dougherty county bridge and highway bonds was defeated at the recent election. A. J. Lippitt is Chrmn. Board of Roads and Revenue.

Ga., Americus.—Election called for Sept. 4 in Sumter county on \$200,000 of 4½ per cent. 30-year road and bridge bonds is postponed without date. Address County Commrs.

Ga., Bainbridge.—Mayor J. W. Callahan says that the proposition to issue hospital bonds (\$20,000) was defeated at the late election.

Ga., Buchanan.—Election reported called for Sept. 19 on \$15,000 of 5 per cent. school-building bonds; denomination \$1000. Address School Board.

Ga., Donaldsonville.—\$15,000 6 per cent. 15-21-year bonds School Dist. No. 13 are voted; dated Dec., 1914; maturity serially 1929 to 1945. Address Board of Trustees.

Ga., Hawkinsville.—A vote may be taken on \$35,000 of public-improvement bonds. Address The Mayor.

Ga., Louisville.—\$12,000 of sewer and water-extension bonds have been voted. Address The Mayor.

Ga., Pearson.—The \$10,000 6 per cent. 30-year school bonds recently reported sold were purchased by the Robinson-Humphrey-Wardlaw Co., Atlanta. Benj. T. Allen is Clerk.

Ga., Phenix City, P. O. Girard.—Reported that bids will be received any time for \$15,000 of 5 per cent. 25-year water bonds. Address City Clerk.

Ga., Rockmart.—Date of sale not yet fixed for \$5000 of 5 per cent. electric-light plant bonds voted Aug. 8; denomination \$500; mature \$500 annually, beginning Jan. 1, 1916. R. R. Beasley is Mayor, and A. H. Graef, City Clerk.

Ky., Greenup.—Greenup county, it is reported, will soon vote on a proposed issue of \$200,000 of road bonds. Address County Commrs.

Ky., Hodgenville.—\$14,200 of water-works bonds have been voted. Address The Mayor.

Ky., Lancaster.—Election is to be held in November in Garrard county to vote on \$15,000 courthouse repair bonds. Address County Commrs.

Ky., Ludlow.—\$30,000 of school and \$25,000 of sewer bonds are to be voted upon Nov. 3. Address The Mayor.

La., Crowley.—\$16,000 school district bonds defeated.

La., Jennings.—Contemplated to issue \$7000 of school bonds of Jefferson Davis parish for Fenton School Dist. Address Parish School Board.

La., New Orleans.—Election is to be held Nov. 14 to vote on \$2,000,000 Orleans parish school bonds. Sol. Wexler is Pres. Board of Directors Public Schools.

La., New Orleans.—An issue of \$3,000,000 of 4½ per cent. 50-year bonds to establish a park on Lake Pontchartrain is proposed, and a constitutional amendment will be voted upon at the next State election to permit the issue, this under act of Legislature recently approved. Address The Mayor.

La., Winnboro.—Bids will be received at any time by Jno. L. McDuff, Supt. Franklin Parish School Board, for \$16,000 5 per cent. school bonds.

Md., Cumberland.—\$150,000 of 4½ per cent. \$1000 street bonds offered Aug. 24 were not sold, it is reported. Address A. W. Straub, City Clerk.

Md., Rockville.—Bids will be received until noon Sept. 15 for \$7500 of 5 per cent. Montgomery county \$500 bonds; also for \$55,500 of 5 per cent. \$1000 bonds previously reported. Richard T. White, Jr., is Pres. and Berry E. Clark Clerk County Commrs.

Miss., Hazlehurst.—Bids will be received until 2 P. M. Sept. 7 for \$5000 of 6 per cent. 11-25-year \$100 school-building bonds of Gallman District, Copiah county. Address R. B. Greenlee, Pres. County Suprva., Conn. Miss. Further particulars will be found in the advertising columns.

Miss., Yarn, P. O. Purvis.—\$3000 6 per cent. Yarn Consolidated School Dist. bonds are being offered at private sale; denomination \$1000; dated July 1, 1914; maturity July 1, 1916, to 1925, inclusive. Address J. J. Massey, County Treas.

Mo., Butler.—\$75,000 of 5 per cent. 5-20-year serial water-works bonds voted June 9 will probably not be offered for sale until financial market conditions improve. J. F. Smith is City Clerk.

Mo., Clarence.—No satisfactory bids were received Aug. 24 for the \$10,000 of 5 per cent., denomination \$500, electric-light plant improvement bonds. J. C. Rickey is Mayor, and E. W. Ragland, City Clerk.

Mo., De Soto.—The \$10,000 of school bonds recently noted have been sold.

Mo., Higginsville.—\$15,000 sewer bonds defeated at election Aug. 25.

Mo., Kirksville.—\$25,000 5 per cent. 10-20-year water-works extension bonds were purchased by Mercantile Trust Co., St. Louis; denomination \$500; dated Aug. 1, 1914.

Mo., Montrose.—All bids received for the \$6000 5 per cent. 5-20-year electric-light plant bonds were rejected. Wm. J. Brownsberger is Mayor.

N. C., Macon.—Bids will be received until noon Oct. 5 by P. M. Stallings, Chrmn. Commrs. Warren County, for \$20,000 5 per cent. Nutbush township road bonds; denomination \$1000.

[For Additional Financial News, See Page 76.]

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Surplus and Net Profits, 450,000
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showing what your production
costs are is not good cost keep-
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good, shows *where* the money
that produces your goods has
gone; what you have *received*
for it, and what the *value* of
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FRED G. BOYCE, Vice-President

JOHN McHENRY, Treasurer

WILTON SNOWDEN, Vice-President

J. R. WALKER,

N. C., Townecreek.—\$10,000 of road bonds of Townecreek Township, Brunswick county, are reported voted. Address County Commrs., Southport, N. C.

N. C., Whiteville.—It is understood that Columbus county still has for sale \$50,000 of 5 per cent. 30-year courthouse bonds, of which \$50,000 were sold last winter. C. C. Pridgen is Chrmn. County Commrs.

S. C., Branchville.—Reported that an election will be held Sept. 22 on \$10,000 of electric-light bonds. Address The Mayor.

Tenn., Crossville.—\$75,000 of 5 per cent. \$1000 road bonds of Cumberland county failed to carry at the recent election. There will not be any issue. Geo. P. Burnett is County Judge.

Tenn., Dickson.—\$10,000 sewer and \$5000 water bonds are voted. Address The Mayor.

Tenn., Knoxville.—Knox county will invite bids for \$100,000 of 5 per cent. 20-year school bonds, of which \$45,000 will be for use within the city and its suburbs. Address R. A. Brown, Judge.

Tenn., Memphis.—Concerning the report that this (Shelby) county was considering an issue of \$325,000 of jail construction bonds, it is stated that no decision has yet been made. Address County Commrs.

Tenn., Murfreesboro.—Election will probably be called to vote on sewer bonds. G. B. Giltner is Mayor.

Tex., Anderson.—\$30,000 of this (Grimes) county's 5½ per cent. 10-30-year road and bridge bonds approved by the Attorney-General at Austin were purchased by Commonwealth Trust Co. of Houston at par and interest; denomination \$500; dated Aug. 10, 1914. Address County Commrs. at Anderson.

Tex., Aransas Pass.—Bids are invited until 2 P. M. Sept. 15 for \$5000 water-extension and \$3000 street-improvement 5 per cent. 20-40-year bonds. Chas. H. Gile is City Clerk.

Tex., Aransas Pass.—Bids will be received until 2 P. M. Sept. 15 for \$5000 water and \$3000 street 5 per cent. 20-40-year bonds; denomination \$1000; dated Oct. 1, 1914. Jesse J. Todd is Mayor.

Tex., Atlanta.—Bids will be received any time for 3000 4½ per cent. 10-40-year water-works bonds voted Aug. 12, 1914; denomination \$500; dated Nov. 1, 1914. Address W. F. Cameron, J. J. Ellington, Sr., is Mayor.

Tex., Austin.—Attorney-General has approved the following securities: \$16,000 5 per cent. 10-40-year Killen water-works, series 1, bonds; \$10,000 5 per cent. 10-40-year bonds Valley Mills Independent School Dist., Bosque county; \$5000 4 per cent. 34-year Bonham garbage crematory bonds; \$10,000 5 per cent. 10-40-year Bonham public school bonds; \$175,000 5 per cent. 20-40-year Beaumont wharf and dock bonds.

Tex., Brackettsville.—No sale was made of the \$80,000 5 per cent. Kinney county road bonds offered Aug. 20. Frank Lane is County Attorney.

Tex., Buckholts.—\$12,000 school dist. bonds are voted. Address Commrs., Milam county.

Tex., Corpus Christi.—City will vote Sept. 3 on \$300,000 water-works extension and improvement bonds. Election Aug. 25 approved city ownership by large majority. Roy Miele is Mayor.

Tex., Cotulla.—Water-works bonds are voted. Address The Mayor.

Tex., Gatesville.—Steps are being taken to hold an election to vote on bonds for sewerage system. Address The Mayor.

Tex., Houston.—The proposed issue of \$5,000,000 of city bonds is to be divided thus: \$3,000,000 for wharves and terminals; \$2,000,000 for sanitary sewers. Ben Campbell is Mayor. Election to be held within six weeks.

Tex., Kountze.—Sept. 12 election will be held to vote on \$125,000 Saratoga & Batson Road Dist., Hardin county, bonds. Address County Commrs.

Tex., Leonard.—\$11,000 5 per cent. 20-40-year bonds Leonard Independent School Dist., Fannin county, were purchased by Well, Roth & Co., Cincinnati, at par and interest; denomination \$500; dated May 1, 1914.

Tex., Livingston.—\$25,000 5 per cent. 20-40-year water-works bonds are voted. Address The Mayor.

Tex., Matador.—Bids will be received until 3 P. M. Sept. 15 for \$17,000 of 5 per cent. 5-40-year school bonds of Roaring Springs Dist. of Motley county; denomination \$1000. Address G. E. Hamilton, Dist. Atty.

Tex., Paris.—No sale made of \$50,000 of 5 per cent. 40-year Lamar county road bonds offered Aug. 20. S. L. Bedford is County Auditor.

Tex., San Angelo.—No bid accepted for the \$80,000 of 5 per cent. 10-40-year high-school bonds offered Aug. 24. Address Concho Valley Loan & Trust Co., Treas. city of San Angelo.

Tex., San Antonio.—Election is to be held to vote on \$21,000 5 per cent. 10-30-year bonds common school dist. No. 18, Bexar county; denomination \$1000. Address County Commrs.

Tex., San Marcos.—\$30,000 of city hall and fire department bonds are reported voted. Address The Mayor.

Tex., Timpson.—Bids are asked at any time for \$17,000 of water-works and \$10,000 street-improvement 5 per cent. 10-40 bonds. B. J. Hawthorn is Mayor.

Tex., Victoria.—\$40,000 of bonds of Road Precinct No. 1, Victoria county, were, it is reported, defeated at the recent election.

Tex., Wichita Falls.—Ordinances have been adopted providing for the issuing of \$20,000 20-40-year park and \$7500 fire-station 5 per cent. bonds voted last June. Address The Mayor.

Tex., Wichita Falls.—\$125,000 road bonds Precinct No. 4, Wichita county, were not carried legally. Result thrown out. Address J. B. Jackson.

Va., Falls Church.—Proposed to issue \$80,000 of road bonds for Falls Church Dist. of Fairfax county. Address J. B. T. Thornton, Judge, Fairfax, Va.

Va., Charlotte C. H.—It is understood that the \$5500 of 5 per cent. 20-40-year optional Charlotte county jail bonds offered Aug. 25 were not sold; denomination \$500. Address P. N. Morgan or J. C. Carrington, committee Board of Supervisors.

Va., Marion.—\$20,000 water system improvement bonds defeated.

Va., Puteski.—\$80,000 of street-improvement bonds have been voted. W. R. Bush is City Clerk.

W. Va., Masontown.—\$25,000 of school-building bonds are reported voted. Address School Board.

W. Va., Piedmont.—Election to vote on \$85,000 municipal improvement bonds is to be held Sept. 14. Address The Mayor.

For Paragould Industries.

Chamber of Commerce,

Paragould, Ark., August 29.

Editor Manufacturers Record:

The Paragould Chamber of Commerce is now engaged in raising a campaign fund of at least \$50,000 to secure manufacturing industries for this community. We realize that this is an ambitious effort for a city of 8000 people, but it is unquestioned evidence that it has 500 live wires.

The Baer plan of financing commercial organizations is the medium through which the fund is to be raised. This plan was inaugurated in Little Rock, where a quarter of a million dollars was secured. The plan, in brief, is the donation and purchase of idle real estate in any community, the proceeds of all donations and purchases to become the property of the commercial organization and to be spent in building the city.

Paragould has engaged Carl J. Baer and C. C. Kirkpatrick, industrial commissioner and secretary, respectively, of the Little Rock Chamber of Commerce, to put on this campaign and raise the \$50,000 fund. They are now actively at work, and have already secured donations of real estate amounting to more than \$15,000. This has been done in less than a week.

Paragould is in Greene county, in the northeastern part of the State, on the Iron Mountain, Cotton Belt and the Paragould Southeastern railroads. It is a division point for the Iron Mountain, and its large shops are here. Paragould is about 30 years old, and has grown in this time to be a city of 8000 people. It has public utilities, including water-works, sewerage, electric lights, concrete sidewalks and five miles of paved streets. It is now building a new \$100,000 modern fireproof hotel. It has two of the largest mercantile establishments in the State of Arkansas, four solid banking institutions, public schools and churches of the various denominations. It has 20 or more manufacturing enterprises including staves, heading, barrels and cooperage products, handles, spokes, wagon stock, brick and tiling.

The city lies between the valley of the St. Francis River on the east and the Cache River on the west, where thousands

of acres of land are producing cotton, corn, rice, wheat, oats and other staple farm products. In the Cache River Valley there remains over 300,000,000 feet of virgin timber, mostly hardwood, and consisting of oak, hickory, gum, ash, elm and cypress. This timber is available for manufacture at Paragould of the various hardwood commodities, such as furniture, wagon stock, implements, handles, automobile stock, railroad timbers, ties, etc. The rice and livestock industry is fast coming to the front in Arkansas.

Closely and Widely Read.

A. W. Reeves, secretary of the Chamber of Commerce of El Paso, Tex., writes to the MANUFACTURERS RECORD:

"We wish to thank you for the very terse, meaty compliment paid the booklet issued by this organization in your issue of July 30. Almost coincident with your journal requests were received from commercial organizations for copies of this booklet, which prove that the magazine is closely read as soon as it reaches its subscribers."

Looking for a Secretary.

The Chamber of Commerce of Lancaster, S. C., according to J. B. Mackerell of that city, is on the lookout for an efficient secretary. Lancaster has a population of 2008, as counted by the census of 1910.

Poor's Manual of Industrials. Publisher, Poor's Railroad Manual Co., New York. Price \$15.

Poor's Manual of Industrials for 1914 (fifth annual number) has been issued. The book contains 2500 pages, about 300 pages more than any previous issue. About 750 new companies have been added and many new income accounts and balance-sheets. These tables are mostly in comparative form. Information is given, wherever possible, showing whether or not bond interest is payable without deduction for the normal United States income tax. In addition, the Manual contains an appendix giving late information on the railroads and utilities, supplementing these two manuals. The publication of this volume completes Poor's Manual for 1914. The three books (Industrials, Railroads and Public Utilities) contain over 6500 pages, covering the entire field of corporate investment in America. They give statements of practically every corporation in which there is a public interest, and are noted for their accuracy, completeness and thoroughness.

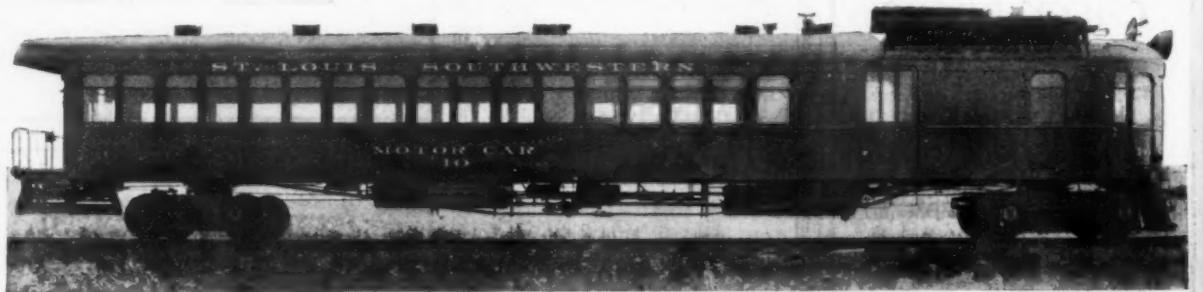
St. Louis Southwestern Gas-Electric Motor Cars.

The St. Louis Southwestern Railway is now placing in service eight gas-electric motor cars built by the General Electric Co. Four cars have been shipped, and two of them are in use. Car No. 10 is now making the trip between Shreveport, La., and Lewisville, Ark., 62 miles. On the route are 10 regular stops, seven flag stops and four railroad crossings. The time for the run is 2 hours and 50 minutes, and one trip each way per day is made. Car No. 11 recently made the first run between Commerce and Sherman, Tex., 57 miles. It left Commerce at 8 A. M. and arrived at Sherman at 10.40 A. M. Returning, it left Sherman at 4 P. M. and arrived at Commerce at 6.40 P. M. All the gas-electric motor cars for this railway are of the type RE-70-B-11. The details of construction conform in general to those of the standard cars manufactured by the General Electric Co. The specific dimensions of the St. Louis Southwestern cars are 70 feet 13½ inches over bumpers by 10 feet 6¾ inches wide over all. They weigh approximately 49 tons, have a

seating capacity for 62 passengers, two per seat, and are each equipped with two GE-205, 600-volt, box-frame, oil-lubricated, commutating pole railway motors having a total of 200 horse-power capacity. The motors are mounted with nose suspension directly on the axles of the forward truck. The generating unit consists of

apparatus measures 11 feet 11 inches long; next is the baggage-room, 10 feet 11½ inches long; then the smoking section, 12 feet 5 inches long, and the passenger compartment, 30 feet 5½ inches long. They are standard gauge.

The body of the cars is of all-steel construction, ex-



an eight-cylinder four-cycle gas engine of the "V" type, direct connected to a 600-volt commutating pole electric generator, designed to meet the special conditions the service demands.

The interior of each car is partitioned into four compartments. The cab in front containing the power plant

cept the seats and interior finish, of mahogany. Rear platform entrances are provided. The bearings and treads and flanges of the wheels conform to M.C.B. standards. The trucks are of the heavy spring lobster type, with elliptic bolster and coil equalizer springs.

UNIVERNISH

The Universal Varnish

This is the Label

I It was

scrubbed with
hot suds
and was as
unharmd as if
it had been
tiling.

II Boiling water

was poured on
one spot for
five minutes,
and did not
loosen
or whiten it.

III A hot dish

was stood on
it until the
rim melted a
ring in it, but
the varnish
inside the ring
was not
affected.

IV Pure Alcohol

was poured
over it,
and did not
harm it
in any way.

V A puddle

of Pure
Ammonia
standing
several
minutes,
did not cut
or even blur it.

VI A half-filled

can stood
two weeks
without
forming the
slightest trace
of skin.



UNIVERNISH

A Trade Name for
Unidversal Varnish
Pale-Hard-Durable
Waterproof
for Use Outdoors or In

Prepared only by
Murphy Varnish Company
Newark U.S.A. Chicago

A good old-method varnish put to the same tests, went to pieces under every test.

No skin in 2 weeks is different from a thick, tough skin in 12 hours.

Quality Is Economy

Classified Opportunities

MEN WANTED

UNDERSIGNED COUNSEL will confidentially negotiate preliminaries for important executive, technical, administrative and professional positions insuring strictest privacy. Not an agency, but a highly-endorsed, high-grade method of negotiating preliminaries only, for \$3000 to \$12,000 men. Send address only for explanation. R. W. Bixby, Lock Box 134-136, Buffalo, N. Y.

AGENTS WANTED among supply dealers and salesmen for an exceptional house-lighting machine, suitable for small homes as well as large; simple, durable, economical; satisfaction guaranteed to customers; has excellent selling points; a live proposition. Write for terms. The Alexander N. Milburn Co., Baltimore, Md.

MEN WANTED—Automobile supply house desires salesmen calling on garage, hardware or grocery trade to handle full line of auto supplies as side line on liberal commission basis. Address No. 1601, care Manufacturers Record, Balto., Md.

MEN WANTED—High-grade salesmen wanted to sell our patented specialties on a commission basis to stationary engineers throughout the South. An attractive proposition as a side line. Address M. G. Melvin Co., Inc., 114 Liberty St., New York City.

A GOOD ACTIVE MAN with \$4000 or \$5000 can form a very desirable connection with a large and prosperous Norfolk firm. P. O. Box 1001, Norfolk, Va.

WANTED—Salesman calling upon coal users to represent us on commission basis, selling "American" Boiler Graphite; used by everyone who burns coal; good commissions. Write us fully, stating territory covered, for whom, and we will send full particulars. American Graphite Co. of Philadelphia, Land Title Building, Philadelphia, Pa.

WANTED—Expert plumbers, sheet-metal and hardware men, and electricians to take off quantities from plans. Builders' Purchasing Bureau, San Antonio, Texas.

WANTED—Manufacturers' agents now calling on architects, contractors, etc., can secure a valuable agency for well-established house. To right men we will give a liberal commission contract, turn over customers, leads in territory and co-operate in getting new business; want men who can build up and hold wholesome staple business. For full details write No. 1589, care Manufacturers Record, Balto., Md.

WANTED—High-grade salesmen for Southern territory, part or entire time. Old established standard paint line. Commission. Address Room 717 Colorado Bldg., Washington, D. C.

AGENCIES WANTED

WANTED—Sales agency for all lines pertaining to builders' specialties; East Tennessee as territory; can furnish satisfactory references to interested concern; modern warehouse facilities. Address Daniel Briscoe, Jr., 325-327 State St., Knoxville, Tenn.

A YOUNG MAN with some experience as salesman desires the agency to represent in Baltimore or in Atlanta a house manufacturing some staple line of goods; highest references. Correspondence desired only with houses of highest standing. Address No. 1595, care Manufacturers Record, Balto., Md.

AGENTS WANTED on liberal commission to sell W. H. Trubue's manufacturers' label gumming machines. A machine weighing about 25 pounds, run by hand and motor power, for putting gum or wax on all kinds of manufactured labels. W. H. Trubue, 32 W. Eighty-third street, New York City.

SITUATIONS WANTED

BUILDING CONSTRUCTION ESTIMATOR and general office man, 29 years old, will be idle September 10; only reasonable salary expected. Give me a chance. C. D. Crockett, care of Ragland-Baxter-Morford Co., Contrs., Nashville, Tenn.

SUPERINTENDENT WANTS POSITION. Can get best results; satisfactory references furnished. Address No. 1603, care Manufacturers Record, Balto., Md.

CONTRACTORS' ENGINEER—13 years' responsible charge large general contract work; 4 years' charge of estimates, contracts, office and field organizations. Will make investment with position as executive. No. 1554, care Manufacturers Record, Balto., Md.

WOULD LIKE A POSITION as representative of manufacturer of belting, steam goods or specialties for Baltimore city and State Maryland; references furnished; correspondence desired. Address No. 1602, care Manufacturers Record, Balto., Md.

CHEMIST—Young man, graduate of Clemson College, with some practical experience, desires position with opportunity for advancement; best references as to character and ability. Address No. 1583, care Manufacturers Record, Balto., Md.

POSITION as teacher of boys by young man who loves them with all his heart; five years' experience. Baxter Genoble, Paeolet, S. C.

RATES AND CONDITIONS

Rate 20 cents per line per insertion. Minimum space accepted, four lines. Maximum space accepted, 25 lines. In estimating the cost, allow seven words of ordinary length to a line. When the advertisement contains a number of long words, proper allowance should be made. Terms: Invariably cash with order; check, postoffice or express order or stamps accepted. No display type used. Questionable or undesirable advertisements will not be accepted. The assistance of our readers in excluding undesirable advertisements is requested. We reserve the right to refuse any advertisement. No patent medicine, whiskey or mining stock advertisements accepted. Rate for special contracts covering space used as desired within one year as follows: 100 lines, 18c. per line; 300 lines 15c. per line; 500 lines or more, 13c. per line.

SUPERINTENDENT or Manager—merchant or steel works blast furnaces anywhere. Technical graduate; wide experience operating and managing. Can perfect organization and produce good results. Address No. 1600, care of Mrs. Record, Balto.

WANTED—Position as superintendent of quarry; 14 years' experience; young man with small family; am hustler and good organizer; can furnish the very best of references. Address M. B. Malone, P. O. Substation No. 2, Charlotte, N. C.

BUILDERS' SUPERINTENDENT, thoroughly competent and energetic, good draftsman and estimator, now located in the South, seeks change of position. Address No. 1596, care Manufacturers Record, Balto., Md.

EDUCATIONAL

RENSSELAER POLYTECHNIC INSTITUTE, TROY, N. Y.—Courses in Civil, Mechanical, Electrical and Chemical Engineering and General Science, leading to the degree of Civil Engineer (C.E.), Mechanical Engineer (M.E.), Electrical Engineer (E.E.), Chemical Engineer (Ch.E.), and Bachelor of Science (B.S.). Also special courses. Splendidly equipped new engineering laboratories. Send for catalogue to Registrar.

SAWMILL DIRECTORY

DIRECTORY OF SAWMILLS, covering States of Alabama, Arkansas, Kentucky, Louisiana, Mississippi, Tennessee and West Virginia. Index on each page shows where plant is located; its capacity; railroad upon which located; what the plant turns out and what its equipment consists of, that is, whether mill is band or circular, whether it has electric-light plant, logging railroad, etc. States specifically what kind of lumber is produced, covering more than 50 different kinds. Sold separately by States at 43¢ per State, or \$15 for all eight States. More than 10,000 mills reported on. Address Southern Lumberman, Nashville, Tenn.

MODELS

MODELS MADE FOR INVENTORS—General machine work. Designing and perfecting. Developing automatic devices and machinery. In a position to do all kinds of light tool and machine work. Prices reasonable. Estimates cheerfully given. Ideal Machine Works, 64 Ann Street, New York City.

EXCELSIOR MACHINES

MONEY in manufacturing excelsior; always market and highest price for the long-fiber dustless grades of excelsior manufactured with the latest improved machines manufactured by W. S. Minor Co., Northville, N. Y.

BUSINESS OPPORTUNITIES

INFORMATION any subject. Congress, corporations, investigations, Gov't bids, trade opportunities. Miscellaneous data and statistics. Researches. Daily news letter. General Information Bureau, Box 263, Washington, D. C.

MANUFACTURER of children's and women's wash dresses would like to correspond with reliable jobbing house for handling output. Address P. O. Box No. 472, Spartanburg, S. C.

DESIGNING ENGINEER wishes to get in touch with parties desirous of financing and building a Magnesia Carbonate and Pipe Covering Plant. Will consider either a salary or commission. Address No. 1597, care Manufacturers Record, Balto., Md.

REFRIGERATING ENGINEER and Machinist are seeking suitable location for ice and cold-storage plant. Have \$7000 cash and would want local men to invest in stock or help finance plant of 15 or 20-ton capacity. Satisfactory references. Address No. 1599, care Manufacturers Record, Baltimore, Md.

FOR SALE—Stock of hardware, sporting goods, etc., with fixtures, in live, growing and up-to-date town of 5000; plenty of work, no labor troubles; established 40 years; good reasons for selling; a good stand. Address E. F. Jarrett, Etnaus, Pa.

CLAY TRACT of 41 acres on Tidewater & Western R. R. at crossing of county road about one mile from Bermuda on James River, known as Epps' Crossing. Tract has been tested over its entire surface, showing clay exists to the depth of 4 1/2 feet and covers entire property with overburden of 3 to 9 inches. The State Geologist reports as being the best found on the coastal plain, suitable for pipe, tile, pavers, fireproofing, and stiff-mud and dry-press face brick. Burns a dark cherry red, drying easily and safely.

This valuable clay bed, with a manufacturing site at Chester, for sale reasonable. The manufacturing site, consisting of between 3 and 4 acres, is on A. C. L. R. R. at junction of Tidewater & Western R. R., affording splendid shipping facilities to North or South by A. C. L. N. & W. S. A. L. T. & W., or by water. With proper development should prove a good money-maker. Full particulars upon request. Address Central Realty Co., Richmond, Va.

A GOOD LIVE LAND MAN to take one-half interest in the best selling contract on well-located lands in the South; very little capital required, as the business is well established; should clear \$100,000 in four years. References required and furnished. Write for particulars. Address No. 1604, care Manufacturers Record, Balto., Md.

I HAVE apartments, hotels, business and investment properties everywhere to exchange for plantations, farms, timber, colonization and coal land. I have a deal for anything you have, anywhere. Also, fine farm and timber lands at lowest cash prices. Write me at once. Arthur M. Connor, 223-4 Oxford Bldg., 726 14th St. N. W., Wash., D. C.

A SPLENDID OPPORTUNITY—Interurban Electric Line.—I have franchise from cities of Opelika, Ala., and Auburn, Ala., also deeds to complete right of way over which to construct interurban electric railway line 12 miles long; population of cities to be joined by the line, 8200. Am ready now to consider propositions to finance this enterprise. Reference, Farmers' National Bank, Opelika, Ala. W. L. Carmack, Opelika, Ala.

WANTED—To connect with individuals who will be willing to invest \$15,000 in a very successful graphite company in the best section in the South. The company is most successful in selling its product, and with additional capital can enjoy increased sales at a large profit. The best references can be given. Address P. O. Box 732, Atlanta, Ga.

WANTED—A man with \$15,000 to \$20,000 to take an interest in large wholesale and retail hardware and builders' supply company as its secretary, which has been in operation for more than fifty years. Present owner, an old bachelor, has made his fortune in this business and desires to retire. Splendid opportunity for experienced man. Address P. O. Box 179, Richmond, Va.

WANTED—To get in touch with promoter who can sell or otherwise dispose of patents recently issued and now pending covering household novelty. All steel, all machine work, cheap to manufacture. Address No. 1593, care Manufacturers Record, Balto., Md.

WANTED—To arrange with reliable manufacturer to handle the only practical revolving swing beam ever invented; patent now pending; can be made cheap and sold at big profit. Will consider outright sale or royalty proposition. Address P. O. Box 298, Rome, Ga.

INDUSTRIES WANTED

MISCELLANEOUS

BLUEFIELD, WEST VIRGINIA, the gateway to the vast Pocahontas coal fields, and the distributing point for half a million unemployed laborers, needs an overall factory, needs a mine implement factory and needs a brick plant. Address C. T. Boykin, Secretary Bluefield Chamber of Commerce.

FREE SITE given for factory; electric power cheap; no city tax; 2 railroads; plenty of labor. Berkeley Land Company, Martinsburg, W. Va.

HENRIETTA, TEX., offers unlimited supply natural gas 4c. to manufacturers; fire brick, tile shales; water; low taxes; healthful; 3 railroads; unusual opportunity legitimate enterprises. Address Booster Club.

INDUSTRIAL PLANTS FOR SALE

SHOW CASE AND STORE FIXTURE PLANT FOR SALE—A show case and store fixture plant fully equipped with high-grade machinery. Everything practically new and in first-class condition. Cost \$22,000, not including site. Must be sold before October 1st. This immediate market will consume practically the entire output, including inside trim, for which there is a fine demand at good prices. There is no other fixture factory within 100 miles of Birmingham and it offers the best opportunity for such a plant in the entire South, and will be sold at a bargain. Terms can be arranged for part purchase price. Come and see it, and if not found as represented we will pay all expenses. Acme Canopy Co., Birmingham, Ala.

GREY IRON FOUNDRY

FOR SALE—Grey Iron Foundry; fully equipped; a good proposition to a practical man. Address Vulcan Iron Works, Houston, Tex.

GRIST MILL AND BRICK YARD

A REAL BARGAIN, COUNTRY GRIST MILL, with 108 acres of land. Building and machinery insured for \$2000; to close an estate, \$1800; cash takes all. Also, a fine brick yard, right on the James River; navigable water, new machinery, 100 acres of land, wharf on the property; also store and postoffice; only \$7000; easy terms. For particulars address, with stamp, Deverell & Co., Claremont, Va.

MINERAL AND TIMBER LANDS, WATER POWERS AND MISCELLANEOUS PROPERTIES

FOR SALE—Hardwood timber on 5000 acres of mountain land immediately on railroad; principally oak, chestnut, hemlock and poplar; pay for as cut and sold. Address North Carolina Tale & Mining Co., Hewitts, N. C.

NO. 571—TIMBER TRACT—2100 ACRES. Either timber right or in fee; actual timber area, 950 acres; timber over eight inches estimated to run over 15,000,000 feet; varieties, pine, oak, hickory, poplar, ash and walnut.

Coal Land in West Virginia—Two small and several large tracts of proven quality. Orchards—Two bearing orchards that will net 20 per cent. on the price asked for same. For particulars regarding these and other Virginia properties address Edward S. Wilder & Co., Charlottesville, Va.

COAL, OIL AND GAS LAND

FOR SALE CHEAP IF SOLD AT ONCE—1500 acres coal, oil and gas land in the heart of the Clinchfield coal region on the new line of C. C. & D. Ry. in Southwest Virginia. If interested, write quick to W. H. P. Baker, Praise, Ky.

PHOSPHATE ROCK DEPOSIT

FOR SALE—Two million tons of blue rock phosphate in the ground near Mt. Pleasant, Tenn., running from 58 to 72 per cent. bone phosphate of lime; no potash required; simply grind the rock and apply to land; spur of the L. & N. R. R. runs through it. Capt. W. N. Hughes, U. S. A., 523 1/2 Broadway, Nashville, Tenn.

MANGANESE ORE FOR SALE

MANGANESE ORE FOR SALE—I wish to get in touch with factories and dealers in manganese. I have two or three deposits from which I can furnish ore of good quality if the price and contract will justify mining. M. M. Caldwell, Roanoke, Va.

FULLER'S EARTH AND KAOLIN

FULLER'S EARTH AND KAOLIN—England and Germany at war; no more from there. We have deposits as good as any ever imported from these two countries. Now is your time. Southern Ins. & Realty Co., Ga. Casualty Bldg., Macon, Ga.

OIL LEASE

VALUABLE OIL LEASE: For sale, or will take in partner for development, an oil lease of 75 acres. One small well now pumping. Sure of more wells. Full equipment. Address No. 1598, care of Manufacturers Record, Baltimore, Md.

TIMBER FOR SALE

FOR SALE—40,000,000 feet of good timber, with sawmill and complete outfit; very low freight rates to Gulf ports; very cheap and on easy terms. James A. Terry, Mobile, Ala.

FOR SALE—18,000,000 feet of timber, of which 10,000,000 is cypress, and as fine quality as grows in the South; balance good hardwood and pine. Will sell on stumpage basis to reliable manufacturers. Price \$4 per thousand. Address the People's Bank of Savannah, Savannah, Ga.

Classified Opportunities

TIMBER.—5595 acres oak, hard maple, poplar, etc., in Webster Co., W. Va., 3 miles from railroad; estimate, 21,000,000 feet; reasonable terms; ample time to remove. Price \$60,000. John I. Carson, Washington, Pa.

FOR SALE.—Seven hundred thousand feet pine, 10 to 36 inches, well bunched; stands on 80 acres; 6 miles R. R.; 4c. rate Norfolk; logging fine; quick sale will make sacrifice and sell for \$2.50 per M. W. A. Joyner, Branchville, Va.

TIMBER LAND FOR SALE

A FEW good tracts in Southern States at prices attractive for investment or operation.

1,000 A. hardwood, Va., \$15,000.
2,000 A. hardwood, S. C., \$22,000.
5,000 A. hardwood, W. Va., \$40,000.
14,000 A. hardwood, Va., \$130,000.
4,800 A. pine, Tenn., \$46,000.
10,000 A. pine, Ga., \$30,000.
20,000 A. pine, N. C., \$300,000.
15,000 A. hem. and spruce, N. C., \$385,000.
25,000 A. hem. and spruce, Tenn., \$1,000,000.
1,000 A. cypress, Ala., \$90,000.
Real Estate Investment Co., 816 Connecticut Ave., Washington, D. C.

21,000 ACRES on A. C. L. Ry. and navigable river; cruisers' estimate shows 90,000,000 feet short and long leaf pine, gum, cypress, poplar, etc.; logging easy. Johnson's A. & F. Real Estate Exchange, 926 Pennsylvania Ave. N. W., Washington, D. C.

TIMBER TRACTS located for manufacturers or investors by practical timbermen. Correspondence solicited. Jo A. Parker, Parma, Mo.

5400 ACRES of virgin hardwood timbered land in East Tennessee, \$10 per acre; would exchange. Farm Realty Co., 328 Jefferson Co. Bank Bldg., Birmingham, Ala.

FARM AND TIMBER LANDS

FARM AND TIMBER LAND on the easy-payment plan; some small improved tracts; good for cotton, corn, alfalfa and grain. Prices from \$4 to \$25 per acre. W. Knight, Real Estate Dealer, Bigelow, Arkansas.

FOR SALE.—About 20,000 acres of land in fee in Eastern North Carolina, in close proximity to railroad. This land contains about 60,000,000 feet of pine and cypress timber. The land without the timber is splendid for farming. With the timber off is worth the price asked for the whole. Timber, Box 1089, Norfolk, Va.

FOR SALE.—Farm and Timber Land in Southeast Georgia. Land produces two and three crops per year. Especially adapted to growing cotton, corn, alfalfa and, in fact, anything that grows in the Southern States. If interested, write us for full information. South Georgia Farms & Realty Co., Fitzgerald, Ga.

FLORIDA farm, citrus fruit and timber lands in tracts of five thousand to one million acres. Address H. B. Wordehoff, Plant City, Fla.

COAL AND TIMBER LANDS

SPRUCE, WHITE OAK, YELLOW PINE, cypress and coal lands for sale. Apple and peach orchards. Clinchfield Timber Co., Linville, N. C.

ORCHARDS

APPLE ORCHARDS, full grown, in this county will net from \$200 to \$400 per acre. I have a few shares of stock for sale in producing orchards, also some producing orchards for sale. Write for booklet and information. H. L. Alexander, Martinsburg, W. Va.

FRUIT, FARM AND TRUCK LANDS

FLORIDA

THE PALATKA FARMS COMPANY of Palatka, Florida, offers to homeseekers the very superior advantages of splendid soil, adapted to potatoes, corn and trucking, or that for oranges and grapefruit, or for combination of both, with location unsurpassed, lying along the beautiful St. Johns River. 2 miles of Palatka, an up-to-date city of 8000 population. It boasts of electric-light and gas plants, four railroads and cheap river transportation. Write for literature. P. J. Becks, Palatka, Fla.

THREE MONTHS FREE.—Subscription to the Indian River Farmer. For truckers, fruit growers, general farmers, and folks who want to know about Florida. Address Indian River Farmer, Dept. "V-1," Bero, Fla.

FOR SALE.—50,000 acres in St. Lucie county, Florida; 20,000 acres in Manatee county; 30,000 acres in Lake county; 6240 acres in Polk county; all well located; excellent colonization tracts. Address P. F. Quinn, Vinton, Iowa.

LARGE BEARING ORANGE GROVE of 35 acres, 162 acres land, good 6-room dwelling, barn and tenant-houses; average annual crop 7500 crates; price \$50,000, half cash. H. B. Wordehoff, Plant City, Fla.

19,000 ACRES of the very best farm and vegetable land South Florida; on R. R.; solid body; artesian water; easy terms; for a short time will offer for \$7.50 per acre; land retelling for \$100 per acre adjoining. G. C. Rogan, Lakeland, Fla.

FOR SALE.—In heart of nice West Florida village, 25 acres of fine land, good buildings, 300 bearing orange and grapefruit trees, 700 younger; several hundred other fruit trees; a bargain. Write G. W. Hinsey, Apalachicola, Fla., for particulars.

FOR SALE.—Ideal citrus land, 40-acre tracts and up; in the proven district; high and healthy. Special inducements to parties of four or more. J. D. Clark, Bartow, Fla.

INDIANA

FOR SALE.—132½-acre farm near Memphis, Ind.; good 8-room house; big barn and all necessary outbuildings; 30 acres timber; rest in cultivation. Apply C. H. Cranfill, 419 S. Preston, Louisville, Ky.

VIRGINIA

FINE FARM, 206 acres, located in Southampton county, Virginia; 156 acres cultivation; sawmill, cotton gin, buildings, etc. Write for particulars. Splendid opportunity for a good farm at a reasonable price. W. A. Joyner, Branchville, Va.

MACHINERY AND SUPPLIES

CHANGING PRODUCT and EQUIPMENT. EXCELLENT MACHINES. BARGAINS. Tumbling Barrels, \$10, \$15, \$20, \$25; Alligator Shears, \$20 up; 16" Shearing Presses, \$100; Emery Grinders, \$2 up; Power Presses, \$15 up; 40" Fan Blower, \$10; 21" Drill Press, \$30; Lathes, \$10, \$25, \$50 up; Large Power Grind-Stones, \$20; Bolt Headers, \$100 up; Bolt Threaders, \$30 up; Nut Tapper, \$15 up; Washer Press; Small Rolling Mills; Planers; Shapers; Milling Machine; Shafting, Hangers, Pulleys, 1c. lb. Shelton Company, Shelton, Conn.

FINANCIAL

WANTED.—\$25,000 at 6 per cent., three years, first mortgage real estate worth \$65,000 as collateral. "Orchards," Charleston, S. C.

PATENTS FOR SALE

FOR SALE.—A patented device to hold and wash ice-cream dippers at soda fountains; the only thing of its kind known; will sell reasonable. E. Davenport, 510 Mesquite St., Corpus Christi, Tex.

PATENTS AND INVENTIONS

INVENTIONS developed by practical manufacturers. We have designed and manufactured the simplest and most complicated devices. References furnished. Russell Machine Co., Live Oak St., Dallas, Texas.

PATENT ATTORNEYS

EUGENE C. BROWN, ENGINEER AND PATENT LAWYER, Suite 40 Victor Building, Washington, D. C. Member Bar U. S. Supreme Court. Patents and Trademarks. Inventions are considered both from Engineering and Legal standpoints in my prosecution of patents. An experience of over 9 years as Examiner in U. S. Patent Office and over 6 years as Patent Expert in important patent suits are my special qualifications. Reports upon validity and infringement. Send sketch of invention for advice.

PATENTS.—Herbert Jenner, patent atty. and mechanical expert, 606 F St., Washington, D. C. I report free of charge if a patent can be had and its exact cost. Send for circular.

VALUABLE INVENTIONS justify only best legal service. Consult Vernon E. Hodges, Attorney-at-Law, Barrister Bldg., Washington, D. C. Practice before the U. S. Supreme Court; all Circuit Courts; Courts of the District of Columbia, and the U. S. and Foreign Patent Offices exclusively. Continuous practice since 1886. Extensive experience with all classes of invention, representing lawyers, manufacturers and inventors in every State.

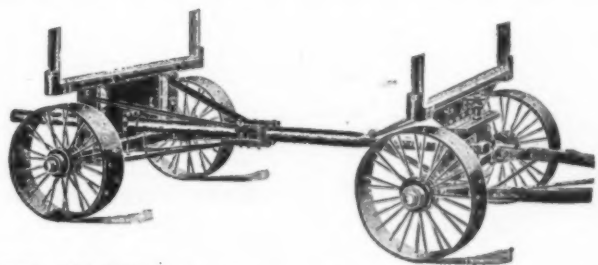
PATENT YOUR INVENTION.—Send sketch for free expert search and report as to patentability. Books on inventions and patents, and book of references from congressmen, manufacturers, bankers and inventors, sent free. John S. Duffie & Co., Patent Attys., 620 F St. N. W., Wash., D. C.

PATENTS THAT PROTECT.—Careful, honest work in every case. Patent your ideas; they may bring you wealth. 64-page book free. Fitzgerald & Co., 817 F street, Washington, D. C. Established 1878. Send for our book.

PATENT YOUR IDEAS.—\$9000 offered for certain inventions; book, "How to Obtain a Patent" and "What to Invent" sent free upon request; send rough sketch for free report as to patentability. We advertise your patent for sale at our expense. Chandlee & Chandlee, patent attorneys, 978 F St., Washington, D. C.

PATENTS THAT PROTECT AND PAY. Advice and books free. Highest references. Best results. Promptness assured. Send sketch or model for free search of Patent Office records. Trade-marks registered. Watson E. Coleman, Patent Lawyer, 624 F St., Washington, D. C.

PATENTS secured or Fee returned. Send sketch for free report as to patentability. Guide book and what to invent, with valuable list of inventions wanted, sent free; \$1,000,000 offered for one invention; \$16,000 for others. Patents secured by us advertised free in World's Progress; sample free. Victor J. Evans & Co., Washington, D. C.



STEEL WHEELS for any purpose, any size to fit any axle, with or without roller bearing. **STEEL AXLES,** straight or bent; or **WOOD AXLES, LOG WAGONS, FARM TRUCKS, TRAILER WAGONS.**

Lumber Buggies and Carts

— ALSO —

DESIGNERS of special mountings of all kinds of concrete mixers, gasoline engines, well drills, etc., built to customers' requirements.

Our heavy hauling equipment considered the standard the country over.

Write us about your needs. Let us help you solve your hauling problems.



WRITE FOR CATALOGUE

ELECTRIC WHEEL CO., MFRS.

5 Ohio Street, QUINCY, ILL., U. S. A.

The South of Today

Ahead of the Nation in 1880

In 1880 the United States, with 50,000,000 population, had total capital invested in manufactures of..... **\$2,790,273,000**

In 1913 the South, with population of 33,000,000, has capital invested in manufactures of..... **\$3,500,000,000**

It is not worth your while to study a section which, with one-third less population, has 30 per cent. more capital in manufacturing than the United States had in 1880? This vast manufacturing capital means more and larger towns and cities, more great office buildings, more municipal improvements, an ever increasing demand for machinery, supplies of all kinds, hardware, etc. And yet Southern development, great as it is, has only begun.

The way in which to keep posted about the South and to secure Southern business is through the Manufacturers Record.

PROPOSALS

BOND ISSUES

BUILDINGS

PAVING

GOOD ROADS

GOVERNMENT PROPOSALS

PROPOSALS FOR STEEL ANGLES. Plates, I Beams and Channels, Cold-rolled Steel, Tool Steel, Frogs, Point Switches, Steel Rails, Track Bolts, Tie-plates, Nut Locks, Bolts, Nuts, Rivets, Boat Spikes, Washers, Reamers, Pipe Cutters, Files, Nails, Wire Rope, Chain, Locomotive Tires, Brass Nuts and Screws, Corrugated Roofing, Bronze, Paintbrushes, Whitewash Brushes, Water Coolers, Cardboard, Paper, Sandpaper, Manganese Dioxide, Potassium Chlorate and Switch Ties.—Sealed proposals will be received at the office of the General Purchasing Officer, The Panama Canal, Washington, D. C., until 10:30 A. M., September 14, 1914, at which time they will be opened in public, for furnishing the above-mentioned articles. Blanks and general information relating to this Circular (No. 867) may be obtained from this office or the offices of the Assistant Purchasing Agents, 24 State Street, New York City; 614 Whitney-Central Building, New Orleans, La., and 1086 North Point Street, San Francisco, Cal.; also from the U. S. Engineer Offices in the following cities: Seattle, Wash.; Los Angeles, Cal.; Baltimore, Md.; Philadelphia, Pa.; Pittsburgh, Pa.; Boston, Mass.; Buffalo, N. Y.; Cleveland, Ohio; Cincinnati, Ohio; Chicago, Ill.; St. Louis, Mo.; Detroit, Mich.; Milwaukee, Wis.; St. Paul, Minn.; Chattanooga, Tenn.; Louisville, Ky.; Mobile, Ala., and Galveston, Tex.; Commercial Club, Kansas City, Mo.; Chamber of Commerce, Quincy, Ill.; and Commercial Club, Tacoma, Wash. F. C. BOGGS, Major, Corps of Engineers, U. S. A., General Purchasing Officer.

PROPOSALS FOR LUMBER. Sealed proposals will be received at the office of the General Purchasing Officer, The Panama Canal, Washington, D. C., until 2:30 P. M., September 18, 1914, at which time they will be opened in public, for furnishing lumber. Blanks and general information relating to this Circular (No. 867-A) may be obtained from this office or the offices of the Assistant Purchasing Agents, 24 State Street, New York City; 614 Whitney-Central Building, New Orleans, La., and 1086 N. Point St., San Francisco, Cal.; also from the U. S. Engineer Offices in the following cities: Seattle, Wash.; Los Angeles, Cal.; Baltimore, Md.; Philadelphia, Pa.; Pittsburgh, Pa.; Boston, Mass.; Buffalo, N. Y.; Cleveland, Ohio; Cincinnati, Ohio; Chicago, Ill.; St. Louis, Mo.; Detroit, Mich.; Milwaukee, Wis.; St. Paul, Minn.; Chattanooga, Tenn.; Louisville, Ky.; Mobile, Ala., and Galveston, Tex.; Commercial Club, Kansas City, Mo.; Chamber of Commerce, Quincy, Ill.; and Commercial Club, Tacoma, Wash. F. C. BOGGS, Major, Corps of Engineers, U. S. A., General Purchasing Officer.

TREASURY DEPARTMENT. Supervising Architect's Office, Washington, D. C., August 26, 1914. Sealed proposals will be opened in this office at 3 P. M., October 7, 1914, for the construction complete (including mechanical equipment, interior lighting fixtures and approaches) of the United States postoffice at Narragansett Pier, R. I. Two-story and basement building; ground area, 4039 square feet; partial fireproof construction. Drawings and specifications may be obtained from the custodian of site at Narragansett Pier, R. I., or at this office, in the discretion of the Supervising Architect. O. WENDEROTH, Supervising Architect.

U. S. ENGINEER OFFICE, Wilmington, N. C., August 23, 1914. Sealed proposals for construction of the motor survey boat Neuse will be received at this office until 12 o'clock noon, September 23, 1914, and then publicly opened. Information on application. H. W. STICKLE, Maj., Engrs.

U. S. ENGINEER OFFICE, WILMINGTON, N. C., Aug. 8, 1914. Sealed proposals for dredging in the waterway from Core Sound to Beaufort Harbor, N. C., will be received at this office until 12 M. Sept. 8, 1914, and then publicly opened. Information on application. H. W. STICKLE, Maj., Engrs.

BOND OFFERINGS

\$500,000 Hillsborough County, (Florida) Road Bonds

Tampa, Fla.

The Board of Commissioners of Hillsborough County will receive sealed bids for the purchase of the above bonds, at the office of the undersigned, in Tampa, on or before noon September 15, 1914. Bonds dated October 1, 1913, due October 1, 1943, without option of prior payment. Denomination \$1000. Principal and semi-annual interest at five per cent. per annum (April 1 and October 1), payable in gold coin in New York City, matured coupons detached. Bonds have been engraved and will be certified as to genuineness by the Columbia Trust Company of New York, and the approving opinion of Caldwell, Massich & Reed of New York will be furnished to the successful bidder without charge. Each bid must be accompanied by certified check upon an incorporated bank for two per cent. of the par value of bonds bid for. Delivery will be made in Tampa or New York on October 1, 1914. Payment to be in current money. Further information, together with forms upon which bids must be made, will be furnished upon application to the undersigned or said Trust Company. The right to reject any and all bids is reserved. No bid for less than ninety-five and accrued interest will be received.

W. P. CULBREATH,
Clerk Board of County Commissioners.

PROPOSAL ADVERTISING INFORMATION

RATE: 20 cents per line per insertion.

PUBLICATION DAY: Thursday.

FORMS CLOSE 9 A. M. Wednesday Copy received later cannot be published until issue of following week.

NIGHT LETTER: When too late to send copy by mail to reach us by 9 A. M. Wednesday, forward by night letter.

THE DAILY BULLETIN OF THE MANUFACTURERS RECORD:

Published every business day; gives information about the industrial, commercial and financial activities of the South and Southwest.

The Daily Bulletin can be used to advantage when copy cannot reach us in time for publication in the Manufacturers Record before bids are to be opened, or when daily publications are necessary to meet legal requirements.

The same rate applies—20 cents per line per insertion.

Bonds For Sale

Sealed bids will be received until Monday, September 7, 1914, at 2 P. M., by H. B. Greenlee, President of Board, Conn. Miss., for \$5000 school building and equipment bonds for Gallman Consolidated School District. Bonds in denomination of \$100 each and interest at the rate of 6 per cent., payable annually. Bonds dated September 1, 1914, and will mature eleven to twenty-five years from date.

B. SHELTON, Chancery Clerk,
Hazelhurst, Miss.

Bonds For Sale

Bids will be received by the County Commissioners of Warren County until Monday, October 5, 1914, at 12 o'clock M., for the purchase of \$20,000 of Nutbush township road bonds. These bonds will be in denomination \$1000 and will run for 40 years. Rate interest 5 per cent., payable semi-annually at County Treasurer office, located at the Courthouse in the town of Warrenton, N. C. No bids will be considered unless accompanied by certified check \$200, payable to Chairman, Board of Commissioners. The Commissioners reserve the right to reject any and all bids. For further information address

P. M. STALLINGS, Chairman,
Macon, N. C.

For Quick Sale

\$22,000 Sidewalk Improvement Certificates, payable one, two and three years from July 1, 1914, with 8 per cent. interest from date. Secured by first lien on abutting real estate, and principal and interest guaranteed by the Town of Fort Meade, Florida. Address

FIRST NATIONAL BANK,
Fort Meade, Florida.

WATERWORKS AND SEWERS

Water-Works and Filters

NOTICE TO BIDDERS.

Sealed proposals, endorsed "Proposal for Water-works," will be received by the Mayor and Aldermen of the City of Vicksburg, Miss., at the Mayor's office, until 5 P. M. Monday, September 21, 1914, for furnishing equipment and materials and for building a system of Water-works and Filters for said city according to plans and specifications on file in the office of A. M. Paxton, City Clerk, Vicksburg, Miss., and of A. L. Dabney, Engineer, Porter Building, Memphis, Tenn.

The city has the money in the bank. Each proposal shall be accompanied by a certified check for five per cent. (5%) of the total amount of the bid.

Bond by an approved surety company will be required for fifty per cent. (50%) of the amount of contract, name of surety company to be stated in the bid.

The right is reserved to reject any and all bids.

J. J. HAYES, Mayor,
Vicksburg, Miss., August 6, 1914.

BUILDINGS

Hotel Building

NOTICE TO CONTRACTORS.

Bids will be received at the office of the undersigned until noon the 10th day of September, 1914, for the erection and completion of a two-story reinforced concrete and brick hotel building for George W. West at the town of George West, Texas.

A deposit of \$25 will be required from all contractors desiring to bid on same, guaranteeing that plans and specifications will be returned at designated time.

Water will be furnished free at the building. There will be a switch laid up to building for the benefit and use of the contractor in handling his material.

The right is reserved to reject any or all bids.

HENRY T. PHELPS, Architect,
707-719 Gunter Building, San Antonio, Texas.

School Building

NOTICE TO CONTRACTORS.

Bids will be received at the office of the undersigned until noon the 10th day of September, 1914, for the erection and completion of a two-story brick school building to be built for George W. West at the town of George West, Texas.

A deposit of \$25 will be required from all contractors desiring to bid on same, guaranteeing that plans and specifications will be returned at designated time.

Water will be furnished free at the building. The building will be located about fifteen hundred feet from the railroad track.

The right is reserved to reject any or all bids.

HENRY T. PHELPS, Architect,
707-719 Gunter Building, San Antonio, Texas.

Notice to Sewer Contractors

Charleston, W. Va.

Sealed proposals will be received by the Board of Affairs of the City of Charleston, W. Va., until 2 o'clock P. M. on Thursday, September 10, 1914, for furnishing the material, etc., and constructing a system of sewers in the city of Charleston, ranging in size from 72 inches in diameter down to 8 inches in diameter and aggregating approximately nine (9) miles, together with the work by districts, or sub-divisions of this system of sewers is divided into four (4) districts, and bids will be received on the necessary manholes, catch-basins, etc. same.

Each bid must be accompanied by a certified check for two and one-half (2½) per cent. of the approximate amount of the bid. The Board reserves the right to reject any and all bids in whole or in part. Plans and specifications may be seen at the office of G. S. Brown, City Engineer, Loewenstein Building, Charleston, W. Va.

By order of the Board of Affairs.
J. F. BEDELL,
President.

Water Works at Clinton, N. C.

Sealed proposals for constructing Water-Works in the Town of Clinton, N. C., will be received by the Mayor and Commissioners until 3 o'clock P. M. September 15, 1914. The work will consist of approximately 3½ miles of cast-iron water pipe from 6 to ten inches in diameter, hydrants, valves, deep-well pumps, pumping station, multistage turbine pump, oil engine, storage reservoir and tower and tank to be constructed in accordance with the plans and specifications on file in the office of the Mayor.

Blank forms of proposal, specifications etc., may be obtained from the Engineer. Certified check for five per cent. of the bid must accompany each proposal.

The right is reserved to reject any or all bids.

By order of the Board.

A. B. CRUMPLER, Mayor.

H. A. JAMES, Clerk.

Engineer,
WILLIAM M. PIATT,
Durham, N. C.

Water-Works, Light Plant and Sewer System

San Antonio, Texas.

Sealed proposals addressed to the undersigned will be received at the offices of Bartlett & Ranney, Inc., Consulting Engineers, San Antonio, Texas, until three P. M. September 10, 1914, for constructing water-works, light plant and sewer system at George West, Live Oak county, Texas. Plans and specifications on file with the above engineers, and copies may be secured on deposit of \$10, to be refunded on submission of bid. Right is reserved to reject any or all bids and to waive formalities.

(Signed) GEORGE WEST.

San Antonio, Texas.

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City Hall

NOTICE TO CONTRACTORS.

Meridian, Miss.

Pursuant to a resolution, this day adopted by the Council of the city of Meridian, notice is hereby given that sealed bids will be received by the undersigned clerk and treasurer of the city of Meridian for the erection and construction of a new city hall, in the city of Meridian, Miss., according to plans and specifications prepared by P. J. Krouse, architect, Meridian, Miss.

All bids must be on forms as specified in the plans and specifications prepared by said architect, and must be accompanied by a certified check, payable to the city of Meridian, in the sum of twenty-five hundred (\$2500) dollars, as a guaranty that the bidder will enter into contract with the city of Meridian for the erection of said building in case said contract shall be awarded to him.

Bids will be received up to the hour of 2 o'clock in the afternoon on Tuesday, the 22d day of September, 1914, at which time the bids will be opened by the council and the contract awarded.

Copies of the plans and specifications may be procured from P. J. Krouse, architect, Meridian, Miss., at any time after the 24th day of August, 1914, upon depositing the sum of twenty-five (\$25) dollars with him to guarantee the return thereof.

The right is reserved by the Council of the city of Meridian to reject any or all bids submitted for any cause deemed satisfactory to it.

Witness my signature this 14th day of August, 1914.

R. L. BLANKS,
City Clerk and Treasurer.

Notice to Building and Heating Contractors

Bids will be received at the Council Chamber, Spartanburg, S. C., until 12 o'clock noon September 14, 1914, for the erection of city hall and jail building for the city of Spartanburg, S. C. Each bid for the building must be accompanied with a certified check in the amount of \$500 as a guarantee that if awarded the contract the successful bidder will immediately enter into contract and execute and deliver a surety bond in the amount of \$15,000 to indemnify the owner against loss under said contract.

Heating contractors are required to comply with all of the above conditions, except that the certified check with bid will be \$20 and bond required \$1000.

The right to reject any and all bids is reserved.

Contractors wishing to bid on the above building and heating are instructed to immediately file their application for drawings and specifications with W. A. Edwards, Architect, 632 Candler Building, Atlanta, Ga., accompanying same with a certified check in the amount of \$25, payable to said architect as a guarantee that the contractor will make a bona fide bid on the work and also as a guarantee that he will return the drawings to the architect immediately after the letting without cost to the said architect.

Subcontractors wishing a set of drawings and specifications are required to pay the architect \$10 cash for the use of same.

Drawings and specifications will be on file at the office of the City Clerk, Spartanburg, S. C., in the office of the Builders' Exchange, Candler Building, Atlanta, Ga., and in the architect's office. All bids and bid checks are to be drawn in favor of Hon. John F. Floyd, Mayor, Spartanburg, S. C.

By order of the City Council, Spartanburg, S. C.

JOHN F. FLOYD,
Mayor.

J. B. CARLISLE,
Clerk and Treasurer.

PAVING AND GOOD ROADS

Road Grading

Hillsboro, N. C.

Sealed bids will be received at Hillsboro, N. C., after 3 o'clock P. M., Monday, September 14, 1914, for grading five miles of road. Right is reserved to reject any or all bids. For full information address

R. T. BROWN,
Hillsboro, N. C.

Paving

Richmond, Va.

Sealed proposals will be received at this office until 12 o'clock noon, Tuesday, September 15, 1914, for the following work:

Smooth paving on certain streets (approximately 115,000 square yards); granite block paving on certain streets (approximately 6000 square yards).

Parties will bid on Richmond and Baltimore specifications for granite block paving; sample blocks to be furnished by each bidder.

The Administrative Board reserves the right to let the work in whole or in part, for the concrete base.

Specifications and forms of proposal can be obtained at this office by those proposing to submit bids.

A certified check for \$500, made payable to the City Treasurer, must accompany each class of bid as a guaranty of execution of contract.

The Administrative Board reserves the right to select either broken stone or gravel and the right to reject any or all proposals.

CHAS. E. BOLLING,
City Engineer.

MISCELLANEOUS

To Purchase Traction Engine

Alcorn County, Miss., will purchase one Gasoline Traction Engine, together with Road Grader and Scarifier, at September meeting, 1914. Sealed bids will be received until 2 o'clock P. M. September 7, 1914. Address O. M. Hinton, Corinth, Miss.

Fire Apparatus

Gulfport, Miss.

The Mayor and Board of Commissioners will be in session Thursday, September 17, 1914, for the purpose of having the different fire-fighting trucks and apparatus explained to them with the view of purchasing one or more. All manufacturers of same are requested to have a representative present.

E. W. WELLS,
City Clerk.

Concrete Retaining Wall

NOTICE TO CONTRACTORS.

Sealed proposals will be received by the Board of Affairs of the City of Charleston, W. Va., until 2 o'clock P. M. on Thursday, September 10, 1914, for the construction of a concrete retaining wall along the levee in the city of Charleston, W. Va., containing approximately:

7400 linear feet piling.
2200 cubic yards concrete masonry.
Plans and specifications may be seen at the office of A. S. Brown, City Engineer, Lowenstein Building, Charleston, W. Va. Each bid must be accompanied by a certified check for five hundred dollars (\$500), payable to the order of "Treasurer of City of Charleston."

Right is reserved to reject any and all bids.

By order of the Board of Affairs.

J. F. BEDELL,
President.

Notice to Contractors

INCINERATOR.

Sealed bids are asked for and will be received until 8:30 P. M. Monday, 14th September, 1914, by the City Clerk of Charlotte, N. C., for the construction of a Garbage Incinerator, building a 100-foot by 48-inch radial brick stack, each or all. Copies of the plans and specifications, proposed forms, contract form, bond, etc., may be seen in the office of the City Clerk at the City Hall, Charlotte, N. C., or may be obtained from him by prospective bidders upon depositing \$2, which sum will be refunded upon return of the plans and specifications in good condition. A certified check for at least 5 per cent. of the amount of the bid must accompany each bid.

A. H. WEARN,
City Clerk,
Charlotte, N. C.

Hospital Equipment

(NOTE EXTENSION OF TIME FOR FILING BIDS.)

Sealed bids will be received by the Special Hospital Building Committee of the City Council of Augusta up to 4 o'clock P. M. Tuesday, September 25, 1914, for furnishing and equipping the University Hospitals, located at Augusta, Georgia, with the following:

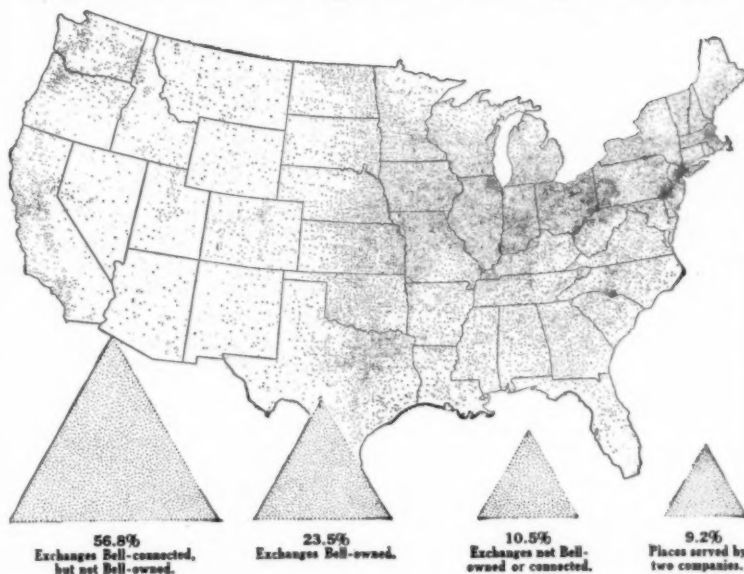
- 1—Iron beds, mattresses and pillows.
- 2—Aseptic steel furniture.
- 3—Linen, blankets, sheets, towels and rubber sheets.
- 4—China and glassware.
- 5—Silverware and cutlery.
- 6—Wood furniture, rugs, shades, etc.
- 7—Surgical instruments.
- 8—X-ray apparatus.

Specifications as to quality and quantities may be obtained by application to W. C. Lyle, M.D., Vice-Dean, Augusta, Georgia. Bids may be made for separate items as numbered, for a combination of items or for whole, but if made for combination or whole, give specific bid for each numbered item.

The city reserves the right to reject any or all bids. Enclose sealed bids in an envelope addressed to:

WM. LYON MARTIN,
Clerk of Council,
Augusta, Georgia.

What the Telephone Map Shows



EVERY dot on the map marks a town where there is a telephone exchange, the same sized dot being used for a large city as for a small village. Some of these exchanges are owned by the Associated Bell companies and some by independent companies. Where joined together in one system they meet the needs of each community and, with their suburban lines, reach 70,000 places and over 8,000,000 subscribers.

The pyramids show that only a minority of the exchanges are Bell-owned, and that the greater majority of the exchanges are owned by independent companies and connected with the Bell System.

At comparatively few points are there two telephone companies, and there are comparatively few exchanges, chiefly rural, which do not have outside connections.

The recent agreement between the Attorney General of the United States and the Bell System will facilitate connections between all telephone subscribers regardless of who owns the exchanges.

Over 8,000 different telephone companies have already connected their exchanges to provide universal service for the whole country.

AMERICAN TELEPHONE AND TELEGRAPH COMPANY
AND ASSOCIATED COMPANIES

One Policy One System Universal Service



Why Put a New Fuse Into the Circuit Every Time You Have a Blowout?

Cut annual fuse maintenance 80% and secure positive electrical protection under all conditions.

ECONOMY RENEWABLE CARTRIDGE FUSES

When an Economy fuse blows, you don't throw it away—you simply insert a new renewal element and have virtually a new fuse. 25 blowouts of an ordinary non-refillable fuse (100 Amps., 250 Volts) cost \$10.12½, while 25 blowouts of an ECONOMY renewable cartridge FUSE of the same capacity cost \$2.10—and remember Economy fuses give absolute protection—they do not vent fire nor hold a sustained arc. They are the only renewable fuses uniformly rated. Economy fuses meet the performance specifications governing the use of such devices.



Why spend four times more than necessary in fuse maintenance? Write today for Bulletin M. R.—and list of prominent satisfied users.

Two renewal elements furnished free with each Economy fuse. Figure the saving yourself.

Economy Fuse & Mfg. Co. Kinzie and Orleans Sts
CHICAGO

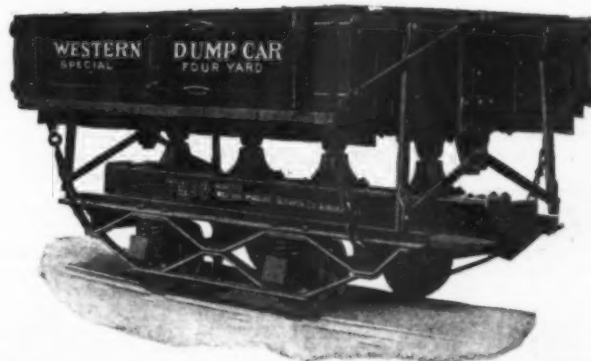
This Car Stands Rough Treatment

Western Special Four-Yard Cars are especially built for use where it is necessary that the cars should stand jolts and knocks that would put an ordinary car out of commission in short order. If you have work of this kind, you should investigate these cars.

Write for folder today.

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INDUSTRIAL NEWS OF INTEREST

Items of news about industrial, railroad or financial interests, building operations, construction work, municipal improvements, or the sale of machinery or the letting of contracts in the South or Southwest, are invited from our readers whether they are advertisers or subscribers or not. We invite information of this character from readers in the North and West about their Southern business operations, as well as from Southern readers. News of value will be published just as readily when from non-advertisers as from advertisers.

Catawba River Bridge Contract.

The Virginia Bridge & Iron Co. of Roanoke, Va., has been awarded a contract by the Commissioners of Gaston and Mecklenburg counties, North Carolina, to construct a highway bridge over the Catawba River at Mount Holly. The new bridge will cost approximately \$19,000, and is 960 feet long, with two main river spans of 200 feet in length, together with about 560 feet of steel approach. The plans and specifications were prepared by the Virginia Bridge & Iron Co.'s engineer, E. E. Hanks, whose offices are at Charlotte, N. C.

The Newman Plants Busy.

With its plants running full capacity, the Newman Manufacturing Co. of Cincinnati, O., manufacturer of brass frames, railings, easels, etc., announces that it is enjoying excellent business, and adds further cheering information that its men on the road report an encouraging outlook for fall business. The company states that the Western, Central and Southern States particularly are showing marked improvement in business conditions, and that a large number of theaters are in course of construction, among which it has a great many contracts for its products.

Westinghouse Officials.

At a meeting of the board of directors of the Westinghouse Electric & Manufacturing Co. of East Pittsburgh, Pa., held in New York recently, Henry D. Shute was elected treasurer to succeed T. W. Siemon, who recently resigned to accept the position of secretary-treasurer of the Union Switch & Signal Co. of Swissvale, Pa. Truman P. Gaylord, district manager of the Electric Company at Chicago, was elected acting vice-president to succeed Mr. Shute. Both Mr. Shute and Mr. Gaylord are members of the American Institute of Electrical Engineers, the National Electric Light Association and other engineering societies.

A. H. Whiteside as Sales Manager of Goulds Manufacturing Co.

Announcement is made of the appointment of A. H. Whiteside as vice-president and general sales manager of the Goulds Manufacturing Co. of Seneca Falls, N. Y., manufacturer of hand, triplex and centrifugal pumps. Mr. Whiteside succeeds Mr. W. E. Davis, who has been obliged to give up some of his active duties, due to injuries sustained several months ago. During the past 15 years Mr. Whiteside has been connected with the Sterling Boiler Co. as Southern manager, with the Westinghouse Electric & Manufacturing Co. as their Baltimore representative, and with the Allis-Chalmers Company as manager of their power and electric department.

The Gablon Jetty System.

The Gablon Jetty method for controlling rivers, perfecting them for navigation, preparing their main channels to take care of all waters flowing into them from their upper watershed, thereby preventing them from overflowing their banks during excessive high water, etc., has been utilized by Charles Kerr of Jackson, Miss., as the basis of a patent for the "Kerr Gablon" which is being developed by the Kerr Gablon Company. The company states the Kerr Gablon system will do all kinds of jetty work at mouths of rivers, causing them to deepen their channels where they empty into the sea, building and deepening harbors, preventing the sea from washing or eroding its banks, reclaiming land from the sea and other jetty work where the assistance of nature is required to make flowing or moving water correct itself by the use of natural forces. The Gablon can be built any height or width. It is constructed round on top and flat on the bottom, which, it is claimed, gives the Gablon the best foundation and the strongest known shape of construction. It is claimed the Gablon will build a sand bar under any caving bank by nature's own forces, and when placed in rivers or the sea it does its own filling and dredging, utilizing the natural action of the current, tides and waves, breaking up

waves, combing them and causing them to deposit the sand and mud in and around the Gablons, building solid land. To facilitate work in the sea, pumps can be used after the Gablons have been placed.

Electric Truck for Lumber Yards.

A novel electric truck which is used for hauling lumber has been developed by the Stetson-Ross Machine Works of San Francisco, Cal. The truck is designed to be driven directly over a pile of lumber which has been previously raised about six inches from the ground. By means of a lever on the side of the driver's seat, two side frames, one on each side of the truck, are forced against the pile of lumber and locked into place. These side frames have a double suspension, one behind the back wheel and the other approximately between the two wheels. After the side frames have been locked in place the driver's clutch is then shifted, and the motor is used to hoist the lumber clear of the ground. To unload, the cables are simply lowered. The side frames are then brought back to their original position and the truck moves out free from the lumber pile. The truck frame is made of angle irons and I beams riveted together and mounted on solid rubber-tired wheels. The motor gear case and jack shaft are directly behind the driver's seat, the controller beneath the seat and the "Iron-clad-Exide" batteries, manufactured by the Electric Storage Battery Co. of Philadelphia, Pa., are on each side.

A Railway Ditching Machine.

A machine for excavating ditches, trenches or other cuts beside railway tracks has been designed and patented by Henry F. Sink of Greensboro, N. C. The excavator is simple in operation and construction, with the two excavating shovels or scoops supported in all positions and adjustable, to secure any desired depth of cut. The machine is provided with a longitudinally extending endless belt conveyor running in opposite directions, in order to discharge excavated material at either end of the superstructure upon which the excavator is mounted. Extending upward and inward from each of the shovels is a flexible belt elevator for transferring excavated material from shovels to the conveyor. The excavating mechanism is supported upon a wheeled superstructure comprising a supporting frame mounted on trucks resting on the track rails, and includes oppositely disposed longitudinal beams extending the entire length of the supporting structure. Steam, gas or electric power can be used for the excavating and conveying mechanism as well as to propel the machine. When the apparatus is not in use or in transportation, the beams which carry the shovels are raised to a vertical position, and the elevator and conveyor are also drawn in against the side of the superstructure, permitting the excavator to pass through tunnels and beneath bridges. For further information address the Sink Railway Ditching Machine Co., Greensboro, N. C.

TRADE LITERATURE.

"Excello" Flame Arc Lamp.

A leaflet entitled "Saving 57 Per Cent. on Lighting," describing the new "Excello" flame arc lamp, has recently been issued by the Kandem Electric Co., Inc., 49-53 E. 21st St., New York. In the leaflet the company treats on the efficiency and current costs in lighting and explains the construction and advantages of the flame arc lamp in upkeep, current, replacements, etc.

A Map of Europe.

A circular containing a map of Europe and smaller maps of Austria-Hungary and Serbia and other Balkan States has been issued by Berry Bros., varnish manufacturers of Detroit, Mich. A copy of the declaration of war issued by Austria-Hungary to Serbia and a brief history of the cause of the war and relative strength of the several countries involved in the European

War are included. The circular will be sent to interested persons upon request to the company.

"J-M" Power Expert.

The August number of the "J-M" Power Expert," issued by the H. W. Johns-Manville Company of New York, contains illustrations of the company's products in actual use in power plants, refrigerating plants, etc. J-M 85 per cent. magnesite pipe insulation, J-M thick brine ammonia sectional coverings, J-M asbestos-sponge felted sectional coverings, J-M fire felt blocks and J-M asbestos cement, and J-M high temperature cement are among the products mentioned in the bulletin.

The Highway Magazine.

The August number of the Highway Magazine, published by the Armo Publicity Bureau of Cincinnati, O., in the interest of American ingot iron culverts, plates, sheet roofing, siding, etc., manufactured by the American Rolling Mill Co. of Middletown, O., contains many interesting discussions on the permanency of modern road building, road drag and its limitations, good roads and good health, out-of-door employment for prisoners, method of construction of slag roads, etc. Illustrations showing the use of Armo culverts in road construction and railroad work are included. For full information about American ingot iron products address Armo Publicity Bureau, Cincinnati, O.

Murray-Corliss Engines.

A special pamphlet, No. 11, has been issued by the Murray Iron Works Co. of Burlington, Ia., on Murray-Corliss engines directly connected to alternating-current generators which are especially adapted for the smaller isolated plants. The Murray-Corliss engines consist of a rolling-mill type frame, sensitive high-speed governor, long-range valve gear, and develop 150 revolutions per minute. The 60-cycle three-phase alternating-current generators were designed especially by the Westinghouse Electric & Manufacturing Co. of East Pittsburgh, Pa., for the Murray Iron Works Co., and are made in 50, 75 and 100 K. V. A. sizes. Other catalogues issued by the company illustrate and describe Corliss engines from 20 horse power up for all purposes, boilers and other machinery for furnishing power plants complete.

The Electrical Industry Offers Opportunity.

"The Young Man and the Electrical Industry" is the title of a story written by James H. Collins, the well-known magazine writer, which has just been issued by the Westinghouse Electric & Manufacturing Co. of East Pittsburgh, Pa. The little book deals with the opportunities afforded a young man in the electrical industry and the different lines in which he may direct his activities as exemplified by the works of the Westinghouse Electric Co. Many illustrations are shown of young men at work on machines that range in size from the gigantic to the microscopic, for in one plant cranes handle parts for enormous turbo-generators, and in another the bearings of wattmeters are being fitted with tiny jewels. The company states that a copy of this book will be supplied to anyone interested in the development of young men.

Van Duzen Concrete Mixer With Side Loader.

The Van Duzen five-foot concrete mixer, equipped with side loader, is illustrated and described in a circular issued by Van Duzen, Royce & Co. of Columbus, O. The company states that at a slight additional cost over the standard mixer the attachment of a side loader practically doubles the output of the machine. It has solid and well-braced holting supports, and the hopper is tilted by an automatic hook which not only dumps it at just the right time, but also prevents it from riding on the chime of the mixing drum. It is operated from the same end of the mixer that the levers for dumping the drum are located, making it a one-man machine. The mixers are made with trucks 3 feet by 6-inch tread furnished with 18x4-inch steel wheels, or on broad-gauge trucks for use where the outfit is to be hauled considerable distances.

"WeiSteel" Building Products.

"WeiSteel" hollow-steel sash as described and illustrated in a catalogue on "WeiSteel" products issued by the Henry Wels Cornice Co. of Kansas City, Mo., is said to be the outgrowth of more than a quarter of a century of practical experience in the manufacture of metal products and the

principles upon which "WeiSteel" sash is constructed. The catalogue contains illustrations and descriptions of self-counterbalanced, vertical sliding, single type, double hung, standard hinged and many other forms of window sash, closet partitions, ventilators, roof ventilators and the "Nonpareil" puttless skylight. The Kansas City Terminal Union Passenger Station, which contains 100,000 pounds of "WeiSteel" products, including skylights, escalator enclosures, ventilators and 267 metal windows, is illustrated in the catalogue, together with other buildings containing the company's products.

Western Electric Telephone Systems

Western Electric magneto telephones and supplies, including tools for constructing telephone lines, etc., are illustrated and described in a catalogue recently issued by the Western Electric Co., 463 West St., New York. The catalogue lists standard telephone apparatus and supplies as are generally used by a telephone company using magneto equipment and having about 200 telephones or less. The company manufactures a complete line of telephone equipment, lead-covered cable and supplies, and equipment for every electrical need from a simple door bell to a large electric-light plant. A special catalogue issued by the company treats on the development and method of manufacture of telephone cords, which is the result of more than 37 years of experience in the manufacture of telephone apparatus. Detail drawings showing construction and method of manufacture of cord tips, central office cords, operators' telephone cords, desk stand cords, etc., are given. Information and prices on telephone equipment will be furnished upon request to the company.

National Tube Co.'s Bulletin 10-C.

"National" bulletin 10-C, issued by the National Tube Co., Frick Building, Pittsburgh, Pa., contains an interesting discussion by William H. Walker, Ph.D., professor of industrial chemistry and director of the research laboratory of applied chemistry, Massachusetts Institute of Technology, on "The Relative Corrosion of Iron and Steel Pipe as Found in Service." In addition to the abstract of the paper read before the New England Water-Works Association by Mr. Walker, "National" bulletin 10-C contains three other valuable articles on the subject of corrosion, namely, "Plain Facts About 'National' Pipe for the Plumber and Steam-fitter," "Relative Merits of Wrought Iron and Steel Pipe" and "Further Discussion of the Relative Merits of Wrought Iron and Steel Pipe," by F. N. Speller, metallurgical engineer, National Tube Co. The company states that "National" bulletin 10, of which No. 10-C represents the fourth edition in two years, seems to be one of the most popular "National" bulletins which has been issued to date. The bulletin will be furnished to interested persons upon request to the company.

How to Build a House of Moderate Cost.

How to build a home of moderate cost is a problem which constantly faces many thousands of American people. With a view to aiding in its solution the Hydraulic Press Brick Co., Central National Bank Building, St. Louis, Mo., makers and distributors of "Hy-tex" face brick, has issued an illustrated catalogue containing about 80 views and plan drawings of "Hy-tex" brick houses costing under \$7500, which were submitted by architects during a brick builders' competition recently conducted by the company. Articles on the function of an architect and the story of brick are included in the catalogue. The plans and drawings were submitted by architects who worked with a definite problem before them. The problem was a detached house, faced with "Hy-Tex" brick, to be built, simple, at a cost of not to exceed \$7500, with provision made for the usual accommodations and conveniences of a small American family of moderate means. It was said that the house was to be located in a town, small city, or a suburb of a large city, on a level lot of any size or shape. All the houses shown in the catalogue were figured at the rate of 22 cents per cubic foot, which included cost of excavation, plumbing, heating, wiring, hardware and painting. First consideration was given to the design and its fitness to the material employed and special attention to the floor space. The company states that it has published these plans with the belief that they will help to develop and give coherent form to the somewhat vague and indefinite ideas of the intending builder.

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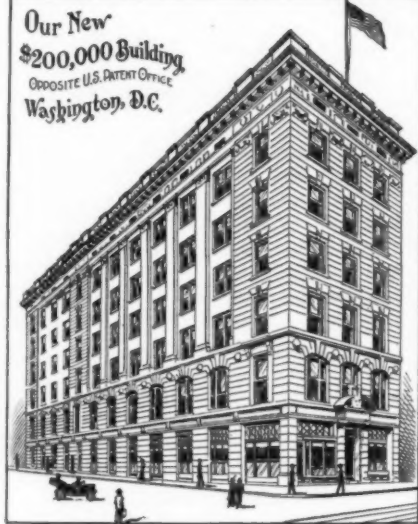
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Owen G. Ashley, bottle opener.
Paul Gnatzig, wheelbarrow.
Charles M. Reynolds, process of manufacturing briquets and other articles.
Adolph H. Thoren, water-power wheel.
Richard H. Uhrbreck, wire clamp.
John Wallbillich, shaft coupling.
Paul Witte, stage screen.
Edward Pauley, airships.
Fred V. Stinson, drags.
Anna Brown, beds.
Paul S. Brenner, film-winding mechanism.
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William Deffenbaugh, music-leaf turners.
Elisha S. Copeland, land markers.
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Milton & Holland, boltless railway rail joints and tie plates combined.
Frank L. Lehtonen, automobile sleds.
Curtis Eugene Snyder, hand stamps.
John C. Moessner, thermostatic circuit closers.
Howard K. Kinney, locomotive and car wheel replacers.
W. R. Hildebrand, printing press attachments.
Warren D. Reist, design for a crochet stand.
A. L. Henson, flying machines.
Antonio Scaturro, safety baby hats.
William R. Ross, switches.
Guy Yantis, tires.
J. E. Manner, latches.
Geo. R. Shipman, fenders for ships.
Geo. A. Roberts, felt-polishing sticks.
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Geo. W. Harnes, waste-cleaning machines.
Frank E. Giles, music-leaf turners.
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Charles Darling, coat hangers.
H. E. Hopkins, railway cattle guards.
Charles W. Gerharts, demountable wheel-hubs.
Willis Engles, internal combustion turbine engines.
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K. A. Tervo, cow milkers.
Lonzo B. Rogers, traps.
Daniel T. Seale, wagon gears.
G. Sjolander, auto rests.
Suyco Tauru, lemon-juice extractors.
Wm. Fields, latch.
Virgil P. Cramer, savings bank.
Abraham L. Fink, garment.
Archibald I. Everett, device for compressing piston rings.
Fred S. Gall, device for capping oil and gas wells.
Charles J. Burrows, hand-rail column.
Michael Chlavetta, time switch.
Harry R. Crooks, bottle.
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Alfred J. Homburg, match-safe.
Gottlieb F. Jehlicke, process of bleaching beetwax.
Charles Hill, automatic match striker.
Peter M. Peacock, flexible pipe connection.
Lloyd L. McLane, vending machine.
John J. Irvin and Wm. Sheppard, car-dumping device.
Robert H. Graham, feed-bag holder.
Edward A. Backus, lubricator.
Charles Lindsey, cross-cut saw handle.
Wm. H. Myers, fruit press.
Charles Obenauer, shipping crate for eggs.
Albert P. Odell, vacuum case.
Louis H. Otto, phonograph attachment.
Theodore C. Papadopoulos, resilient tire.
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Carload Small Direct Current Semi-enclosed Motors at following prices:
 1/4 H. P., 1400 R. P. M.....\$8.50
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Special price in lots of ten.
 We carry large stock electrical machinery. Let us have your requirements.
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One 150 H. P. 4-valve Watertown Engine, operated at 125 lbs. steam pressure; in good running condition.

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 Pittsfield, Massachusetts.

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Now in use, of modern type, first-class order and condition, with full and complete equipment, consisting of Lathes, Planers, Drills, Horizontal and Vertical Boring Mills and Milling Machines.

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FOR SALE—New Lathes at Bargain Prices

Geared head 20"x10", 18"x10", 18"x8", 16"x8", 16"x6". Cone head 20"x10", 15"x8", 15"x6". All the above with semi-quick-change gears. Second-hand lathes with geared heads, quick-change gears, 16"x8", 16"x6", 15"x6". Second-hand lathes, cone head, plain gears, 29"x18", 27"x16", 20"x10", 18"x8", 13"x6", 13"x5".

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1 14x18-inch Left-hand Armstrong Bros. Center Crank Throttling Engine, 72x14-inch band wheel, 75 H. P.; good condition.

1 28x48-inch Left-hand Greenwald Automatic Engine with girder frame, 16-foot by 31-inch band wheel, 300 H. P.; good condition. For prices and further particulars apply to

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A few selections from our big stock of snaps. Write for Free Complete List No. XB 213.

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- 150 H. P. Erie City, 72x18. 150 lbs.
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 400 H. P. Heine. 160 lbs. pressure.
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Also Engines, Dynamos, Motors, Etc.
 Write us for Second-hand Machinery.
HAROLD R. WILSON MACHINERY CO.
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In replacing our manufacturing equipment we find the following first-class

Used Machine Tools

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- 16"x6" Reed.
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 20"x10" Lodge & Shipley, Q. C. G.
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- No. 3 Lodge & Shipley Rapid Reduction Lathe.
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 2 18"x8" Lodge & Shipley Single Pulley Driven Lathes.

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Globe Power Hack Saw, 8" capacity

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- One Marion Double Grinder.
 One Marion Double Grinder on stand.
 One Diamond Disk Grinder on column.
 One Sturtevant Blower, diameter of outlet 2 1/2".
 One "Ohio Planer," 24"x24"x12", with two heads on cross rail.
 Universal Swivel Table for Radial Drill.
 Brown & Sharp Grindstone Frame for 5"x36" stone.
 One Mueller Grindstone Frame for 4"x27" stone.
 One 12"x40" Mumford Molding Machine.
 Write for complete description with prices of machines in which you are interested.

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We Buy and Dismantle

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and all kinds of

INDUSTRIAL PLANTS

We are always in the market to buy

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OF EVERY KIND

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We purchase all grades of old Scrap Material and pay highest market prices. No quantity too large or too small for us to handle. Let us hear from you if you have old scrap material to dispose of.

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Slightly used Pipe from 1" to 12" with new threads and couplings. Thoroughly overhauled and tested before shipping.

We can save you money.

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why our properly rebuilt machinery gives satisfaction

ASK US

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BOILERS, STATIONARY; HIGH PRESSURE: 1 200 H. P. for 125 lbs.; 2 150 H. P. for 150 lbs.; 3 150 H. P. for 125 lbs.; 2 100 H. P. for 125 lbs.; 2 80 H. P. for 125 lbs. Standard from 150 H. P. to 20 H. P. for 100 lbs.

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Sole manufacturers of the Leader Injector and Ejector. Ask for circular.

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 3 400 K. W. Westing. to 18 & 36x30 T. C. Buckeye.

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One 50-ton Climax Locomotive, with extra heavy trucks and gears, thoroughly overhauled.

One 30-ton Baldwin Forney compound locomotive, in fine condition.

Three 72-lb. by 18-ft. boilers, for 125-lb. steam; good as new, with stack, etc.

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One 9-ft. Clark Band mill and one Mershon Resaw.

Also all the machinery of the mill.

Two drykilns and bunks for same.

Machines, shafting, pulleys and blower system of a planing mill.

One carload 25-lb. steel relayers.

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Two marine boilers, two years old; good condition; 52" diameter, 20' long, 18 six-inch flues each. Steam pressure allowed 259 lbs. Fire front, breeching, shaking grates. Address

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100 H. P. ECONOMIC BOILER

Cheap before removal. Made by Erie City Iron Works; complete with fixtures and fittings; good for 100 lbs. pressure; low price to quick buyer to save cost of moving.

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Second-hand, all sizes, 1/2" and larger, with new threads and couplings, guaranteed for service.

1 1/2-yd. Ransome concrete mixer with gasoline motor and loader on wheels.

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Furnished with Threads and Couplings.
Suitable for All Practical Purposes
All Sizes In Stock Ready for Shipment

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250 Volt Direct Connected Sets

2 300 K. W. 250 volts 125 R. P. M. CROCKER-WHEELER GENERATORS to tandem compound Wetherill Corliss engines; like new; used only six months. Each \$8500.00
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75 hp. belted type, complete.
Cheap Power. Sacrifice.

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1 125 H. P. 66"x18" Horizontal Return Tubular, 125 lbs. steam.
1 80 H. P. Vertical, 100 lbs. steam.
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28"x48" Hamilton.
26"x60" International.
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18"x42" Watts-Campbell.
16"x36" Allis.
16"x32" Rickards.
14"x42" Hamilton.
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12"x24" Wetherill.
10"x24" Watts-Campbell.

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1 18"x20 1/4"-13 1/4"x24" Ingersoll-Sargeant Class A Straight Line, two-stage. Capacity 940 cu. ft.
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1 12"x12"x16" Ingersoll-Sargeant Class C Straight Line. Capacity 275 cu. ft.
1 10"x10"x10" Ingersoll-Sargeant Duplex. Capacity 275 cu. ft.
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DIRECT CONNECTED UNITS

1 200 K. W. 220-volt A. C. Westinghouse 3-phase 25-cycle Generator, direct connected to Buckeye Engine.
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32"x12" New York Safety. 36"x14" Smith.
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27"x21" Pratt & Whitney.
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22"x8" Schumacher & Boye Lathe.
20"x12" Lodge & Davis.
19"x12" Fitchburg, with turret attachment.

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11"x8" 10"x18" Retts.
60"x60"x14" Sellers, 4 heads.
60"x60"x14" Pond, 2 heads.
48"x48"x16" Detrick & Harvey Open-Side Planer, cross rail lengthened to plane 60" wide, 3 heads, supplementary rolling table.

36"x36"x12" New Haven, 1 head.
36"x33"x12" New Haven.
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28"x28"x7" heavy pattern, has radius attachment. Several small planers.

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24" American, back geared.
24" Back-Geared Gould & Eberhardt.
16" Walcott.

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Several small Shapers as well as traveling head, besides all sizes of new machines in stock.

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72" Bickford Vertical Boring Mill, 2 heads.
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No. 2 Cincinnati Universal Milling Machine.
No. 2 Adriance Incubable Press.
No. 3 Kempnith Milling Machine.
4 No. 6 Whitney Hand Milling Machines.
No. 2 Warner & Swasey Wire Feed Screw Machines.
3-spindle Barr Sensitive Drill Press.
5-No. 103 Bliss Card Cutting Presses.
3500-lb. Bement, Miles & Co. Double Frame Steam Hammer.
350-lb. Bement, Miles & Co. Single Frame Steam Hammer.
36" Niles Vertical Boring Mill, 2 heads.
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Two Lidgerwood Drag Line Excavators, located near Fellsme, Florida. Machines are in excellent condition. For detailed information, specifications and prices write to

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One Bucyrus Model 14-B revolving steam shovel, practically new. Will sell at great reduction. Apply

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1 each 6, 8 and 10 H. P. Vertical Boilers, complete.

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1 10" dia. Mine Ventilating Fan, with engine.
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The above must be sold without reference to cost. Write us.

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Including Locomotives, Gondolas, Dericks, Hoisting Engines, Boilers, Concrete Mixers, Rock Drills, Buckets, Pumps, Engines, Elevators, Conveyors and Camp Equipment.

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Engineering Department,
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Engine, Porter-Allen, 14 1/2"x24"; Buckeye, 14 1/2"x24"; Phoenix Iron Works, 10 1/2"x12", automatic. Engines, 60 H. P. Firebox Portable; 40 H. P. Firebox Portable; 25x35 H. P. Scotch Boilers; Vertical Boilers, all sizes. Three 18 H. P. Traction Engines, \$350 each; 10 H. P. Springfield Gas Engine; 15 H. P. Superior Gas Engine; 15-horse McKewen Double Drum Hoisting Engine. The above goods must be sold at once.

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1 16x20x416 Ingersoll-Sargeant, class H-1, duplex, steam driven, cap. 1540 cu. ft.

BOILERS

5 250 H. P. Babcock & Wilcox, 150 lbs. steam.

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2 Lidgerwood, 60 H. P., D. C. and swinger, D. C.

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2 Lidgerwood, 14x18, D. C., 3 tandem drum, reversible link motion.
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1 Lambert, 10x12, D. C. D. D., with boiler.
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1 Mundy, 7 1/2x10, D. C. D. D., with boiler.
1 Mundy, 6 1/2x10, D. C. D. D., with boiler.
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2 65-ton Bucyrus 3 1/2-yd. dippers, \$3000 each.

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1 7-ton 4-wheel Industrial, 21' boom.

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Small Steam Shovel

Full circle, traction shovel; state age, shop number, condition, make, size and lowest cash price.

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Quarry equipment, including four 1000 ft. Leechen flattened strand cableways, Hooker carriages, two Flory double-drum and one Lidgerwood single-drum hoisting engines; 150 H. P. return tubular boiler, complete; 30 H. P. Richmond boiler; two-stage 100 H. P. Sullivan compressor; Sullivan V-X undercutter; 10A Cameron pump; large lot new and used pipe, all sizes up to 6 inches; slate makers' tools and dressing machines. Other equipment usual to quarry operations. All in good condition. Will sell in whole or in part at attractive prices.

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12 H. P. Domestic Gasoline Hoisting Engine, single drum, capacity of drum 1200 ft. 1/2" steel cable, capable of raising 1500 lbs. 150 ft. a minute. Also, one Ingersoll-Rand Belt-driven Air Compressor, capacity 100 ft. of free air per minute, equipped with un-loader governor. Both of these machines used less than three months, in first-class condition. Apply

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NEW RAILS

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All second-hand materials guaranteed. Sub-
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10-WHEEL TYPE

Six—Built by Baldwin Locomotive Works
in 1906, excellent condition, modern in every
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Ten-ton Macadam Paving Roller in
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A Buffalo Steam Ten-Ton Tractor and Roller, and
Twelve 5-Ton Wagons for use with it. Used
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Four wheel type

40 tons; 17"x24"; 160 lbs. pressure

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We supply direct on receipt of trial order,
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One Land Pile Driver, 3000-lb. hammer, 50
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Motors, Engines, Pumps, Storage Tanks, etc.
Rock bottom prices. For detailed informa-
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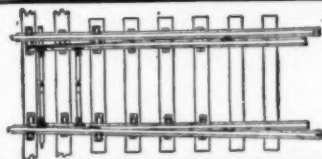
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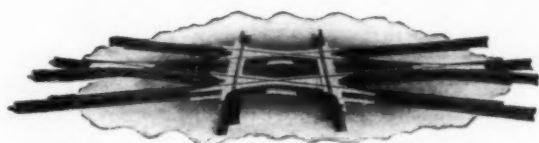
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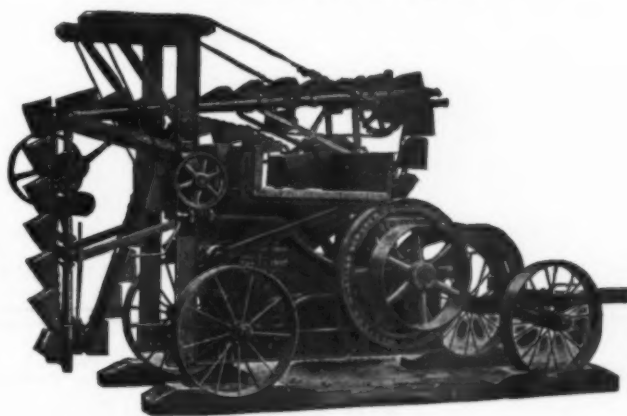
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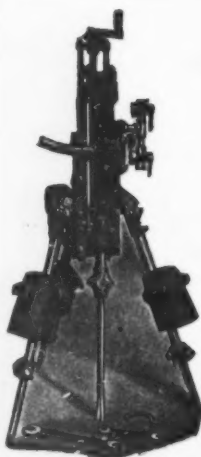
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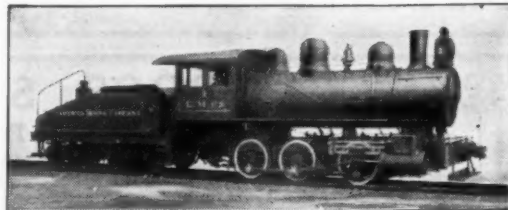
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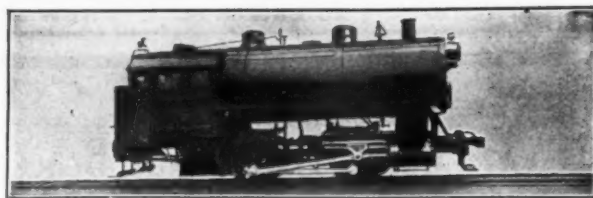


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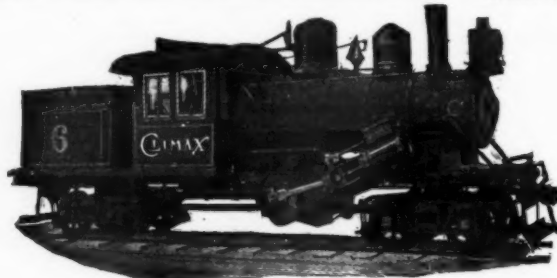
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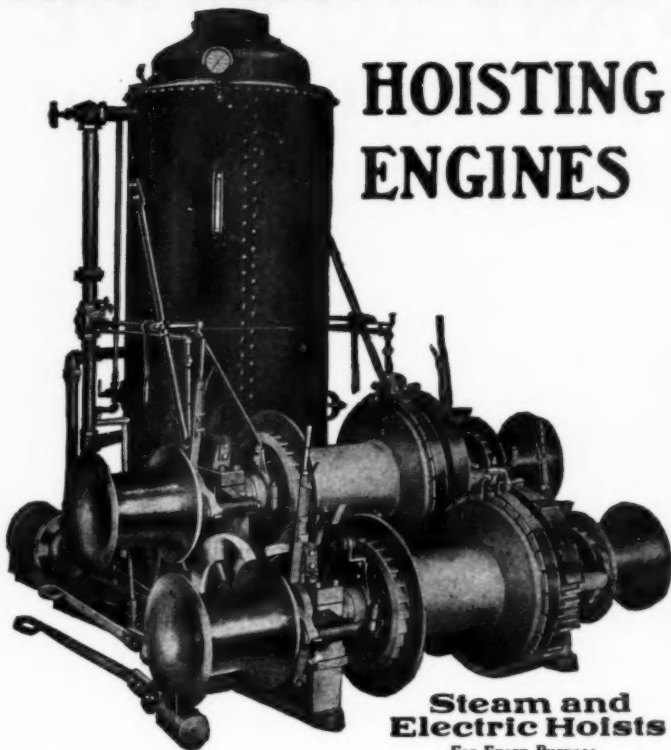
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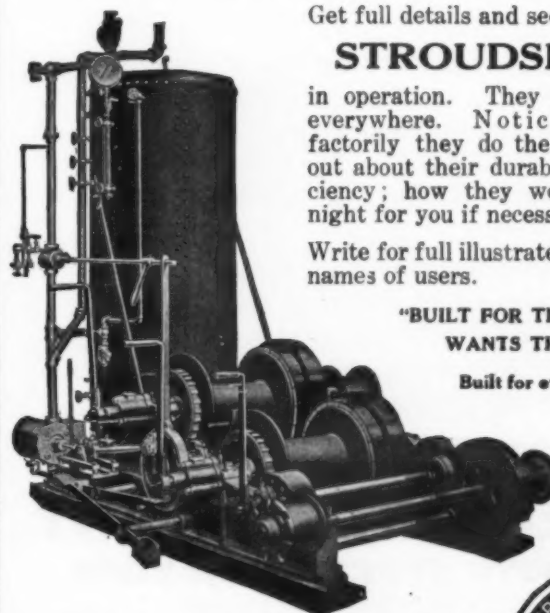
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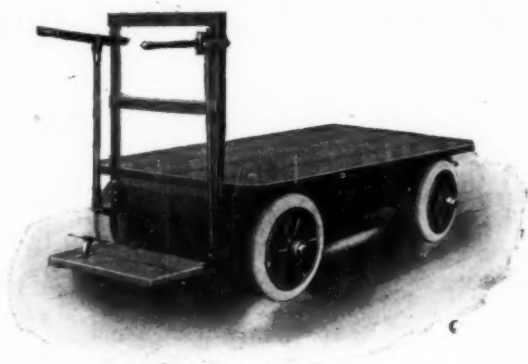
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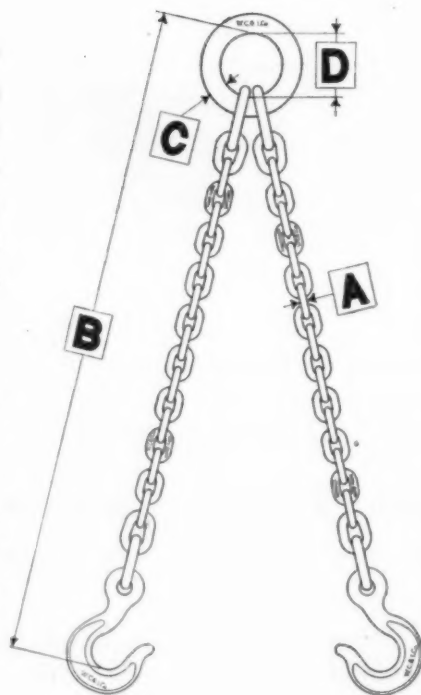
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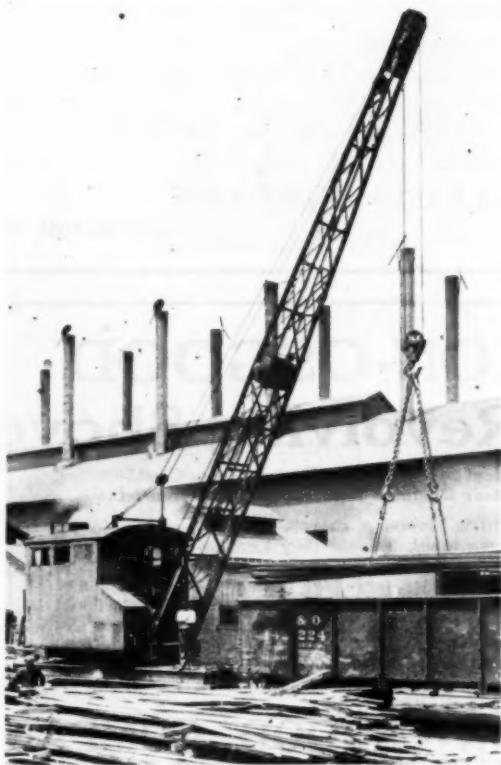
Entire
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Rolled
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High-Grade Hand-Made Tested Chains and FORGINGS

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LOCOMOTIVE CRANES occupy today a highly important place in the art of handling materials. In the one machine is combined a portable hoisting engine, swinging derrick, grab bucket unloader and switching engine. Their adaptability to a wide range of service and conditions finds for them increasing applications.

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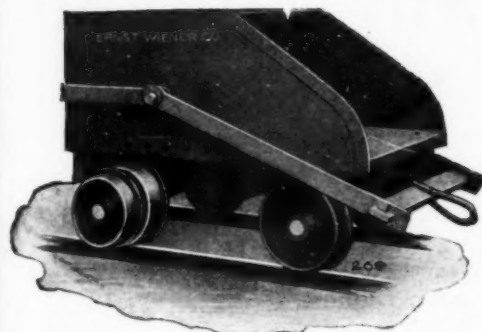
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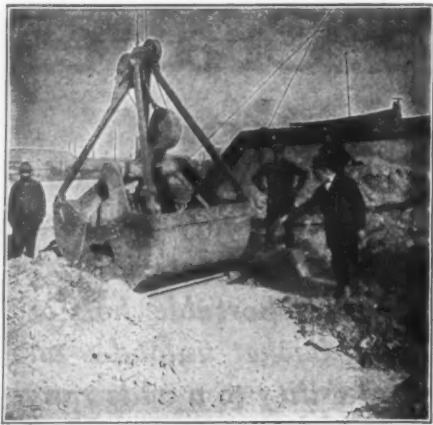
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M-O "18" 3/4-YD., SHIPPING WEIGHT 17 1/2 TONS

MARION-OSGOOD 3-4 Yd. Revolving Shovel

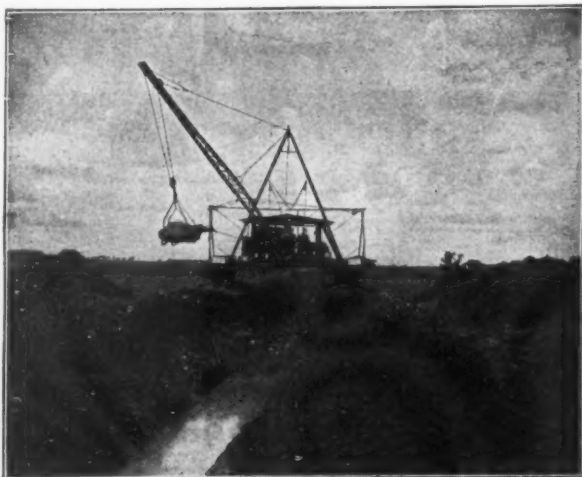
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The Marion-Osgood little revolving shovels are as complete in all details as the larger machines, because they have swinging engines; boom engines; horizontal hoisting engines with link reverse; steam hoisting friction; cut spur gears, large high pressure boiler; pump and injector boiler feeders; oil pump for engines; combination steel and oak boom and handle; steel sheaves; large water tank, etc. They can be mounted on railroad trucks or changed over to clam shell machines when desired, and are arranged to be operated by one man.

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One type of bucket will NOT do every kind of work, but there is a type of bucket suited to every variety of digging and rehandling—and we build it.

HAYWARD DRAG SCRAPER BUCKETS are used for certain kinds of digging; the ORANGE PEEL covers a wider field of usefulness, while the CLAM SHELLS are generally used for rehandling, although when fitted with teeth we recommend them in some cases for digging. Then there is the

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If you contemplate digging canals or irrigating ditches, dredging or the handling of any materials, look into the new Class "B" Hayward Skid Excavators before deciding on the plant you will use. These machines are light and will work over soft ground, and may be mounted on wheels, if desired, at a slight addition in cost.

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Revolving type. Handy to operate.
Simple, Strong, Durable.

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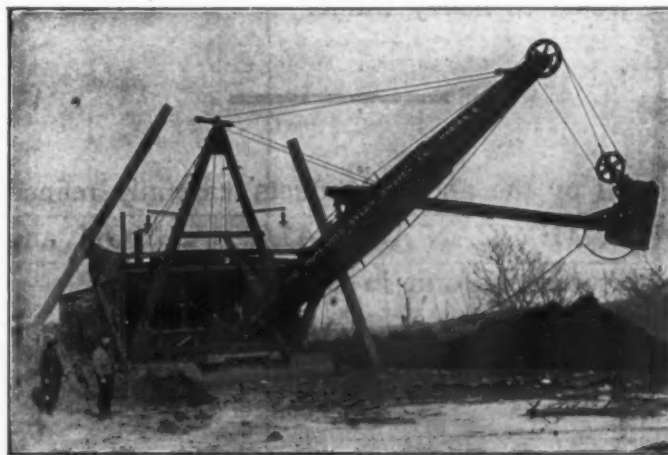
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BERMUDEZ ROAD ASPHALT

"IT STAYS PUT"

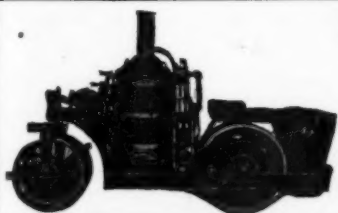
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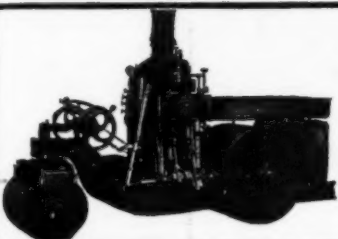
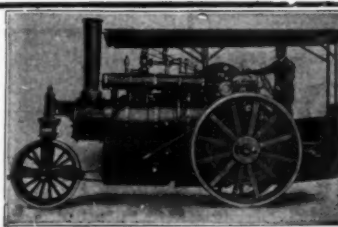
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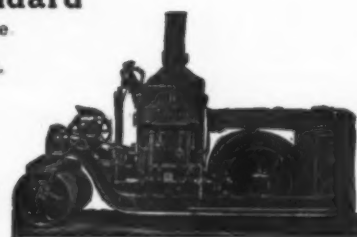
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RED "S" stands for "Salisbury," "Strength," "Service" and "Stability." There is not a point in these culverts that can be improved upon. We make them as perfect as human skill can make them, and we sell them at a price which allows us to make them GOOD.



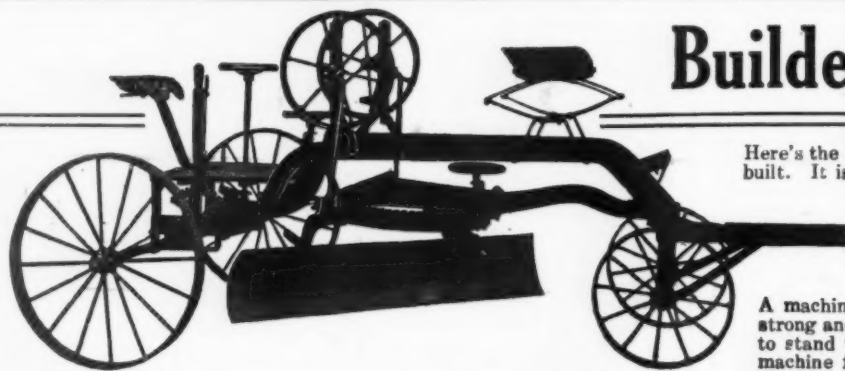
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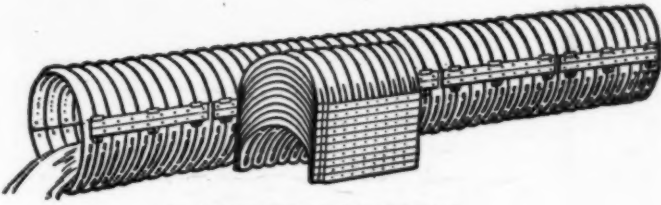
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Every half section exactly alike.
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These culverts have been used for every conceivable purpose and in all parts of the country. They have proven so satisfactory that our *repeat* orders have kept our factories busy. We could furnish hundreds of references, but after all your own experience is the best evidence. A trial order will determine the matter for you. We guarantee satisfaction.

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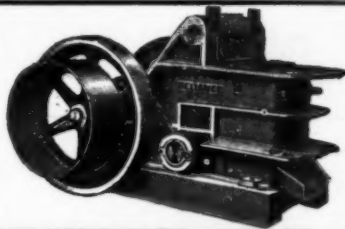
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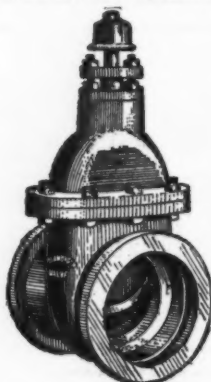
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Pressures,
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Over 50,000
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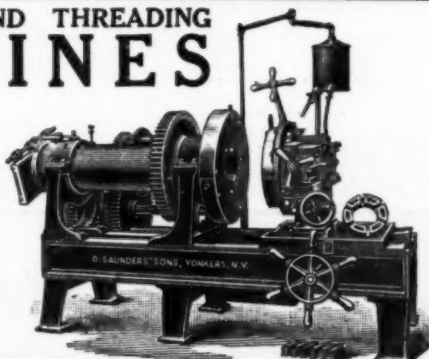
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Interesting Experiences with "KEWANEE" Unions

¶ This is the nineteenth* of a series which we intend publishing in these pages from time to time, giving actual experiences supplied by consumers of "KEWANEE" Unions.

¶ If you have had similar interesting experiences, tell us about them; your brothers in the craft will find yours as interesting as these.

The Union that Pays for Itself Twice

¶ So says this Denver Engineer† who writes the business-like letter that forms

¶ This man says:

"Gentlemen:—

"I am sending you one of the experiences I have had with 'KEWANEE' Unions; some ordinary unions were used for installing water columns on a battery of boilers. The piping of one of these columns did not line properly and it was not possible to keep the union tight even with a lead gasket in place.

"One of the 'just as good as "KEWANEE"' unions was installed; it stopped the leak but on trying to remove the column for cleaning about a year later the nut on the 'just as good' (iron to iron thread) was found to be rusted tight and had to be split. Male and female 'KEWANEE' unions were installed on the entire battery.

"RESULTS—(1) Use of male and female 'KEWANEE' union saved one nipple and one chance for a leaky joint.

"(2) No leaks in the unions since installation.

"(3) A minimum of trouble to take down and clean the columns.

"(4) A saving of two hours' time and about \$0.20 worth of packing each time each column is taken down for cleaning.

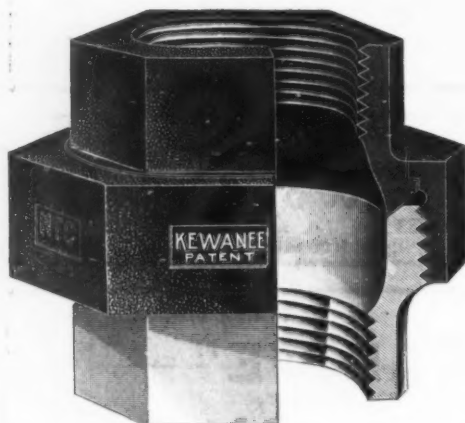
"(5) 'KEWANEE' unions have paid for themselves twice over since installation three years ago.

"Yours truly

†Name and address supplied on request.

You've heard of things paying for themselves—but paying for themselves twice is "some stunt," what? It's no exaggeration to say "KEWANEE" does that—in time and union-bills and trouble saved.

¶ Why not acquaint yourself with this "pay for itself twice union" by sending for The Whole "KEWANEE" Family? Use coupon—please.



The Air-Tested Union with No Inserted Parts

*Experience No. 1—"Twenty Years' Experience with Unions" Published March 6, 1913.

Experience No. 2—"Will They Stay Tight?" Published April 3, 1913.

Experience No. 3—"I Had Concluded To Stop Trying" Published May 1, 1913.

Experience No. 4—"Johnnie On The Spot" Published June 5, 1913.

Experience No. 5—"Kewanees' Never Stick" Published July 3, 1913.

Experience No. 6—"He Cracked His Back" Published August 7, 1913.

Experience No. 7—"Rip 'er Out—Put in 'Kewanee'" Published September 4, 1913.

Experience No. 8—"Rot Out, Never—If You Use 'Kewanee'" Published October 2, 1913.

Experience No. 9—"On A Frosty Morning 'Kewanee' Unions Prevent Cold Fingers" Published November 6, 1913.

Experience No. 10—"Hundreds of Disconnections—One Union" Published December 4, 1913.

Experience No. 11—"There's An Hour's Difference Between These Joints" Published January 1, 1914.

Experience No. 12—"Kewanee' Union Is Equally Good in Hot and Cold Places" Published February 5, 1914.

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Experience No. 19—"The Union That Pays For Itself Twice" Published September 3, 1914.

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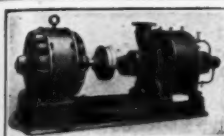
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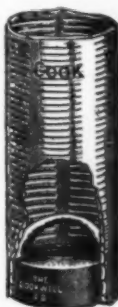
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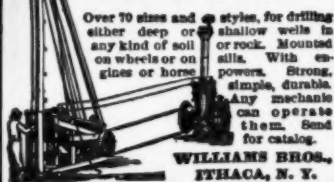
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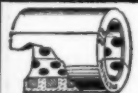
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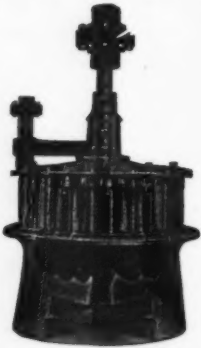
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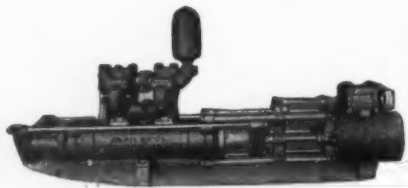
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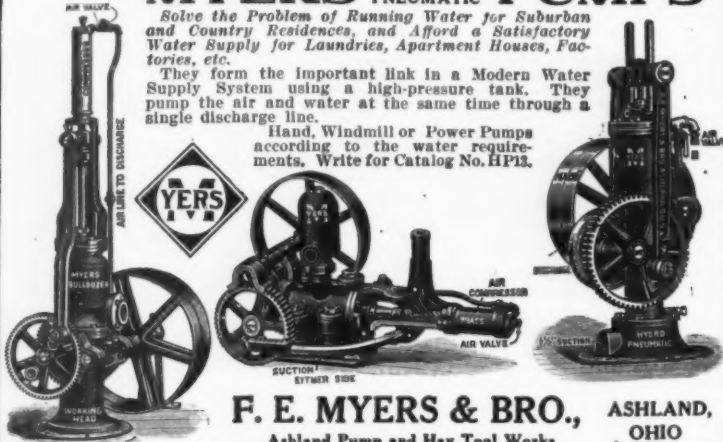
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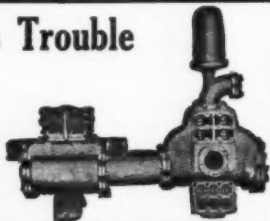
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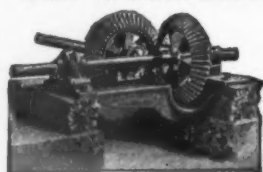
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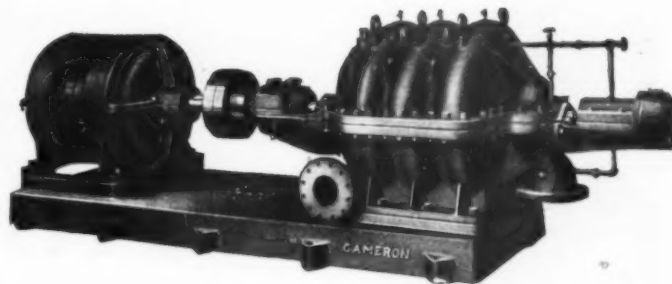
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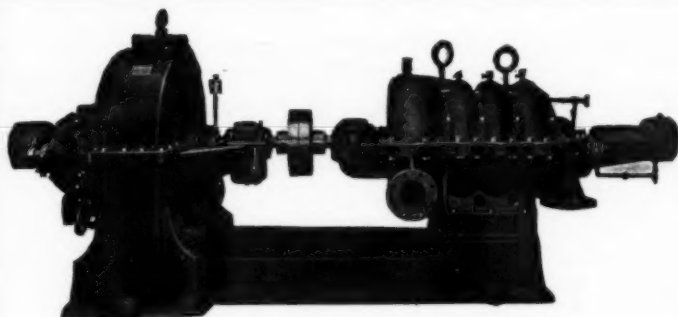
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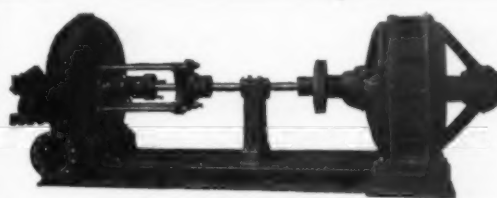
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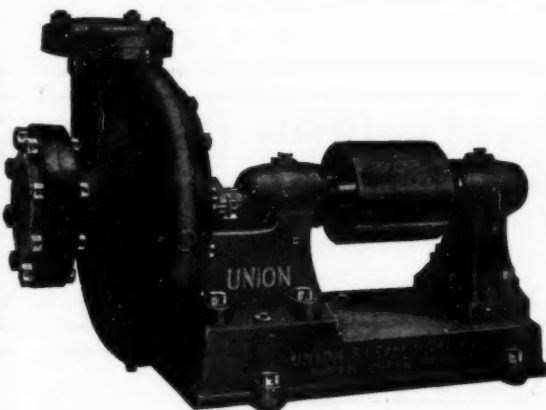
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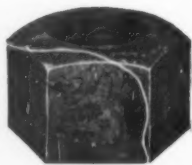
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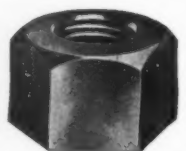
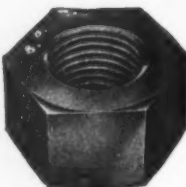
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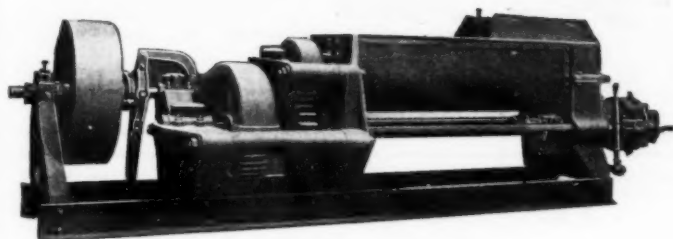
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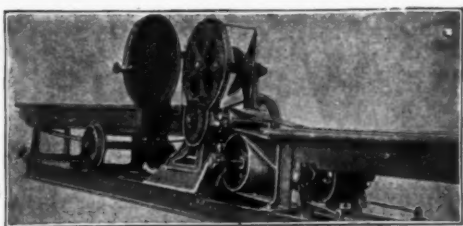
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Twenty-eight miles from New Orleans, La., surrounded by the finest timber lands in the South. Facilities for shipping by water and rail.
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Creosoted Cross Arms, Lumber, Paving Blocks, Piles, Poles and Ties
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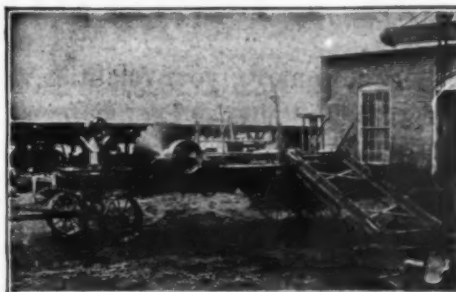
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You can hardly name an important line of business which G. V. Electrics do not serve—and efficiently. Below we show you a 3½-ton G. V. Truck used for hauling ice and flour. The one truck serves a double purpose, enabling its owner to keep it busy throughout the year.



It used to be thought that interchangeable bodies were necessary for "doubling up" in this way, but we have proved that it is not always necessary. There are cases where ice, coal, bricks, bale hay and feed in bags can be handled with one G. V. Truck. The very success of this unusual application of the high-grade Electric demonstrates the great economic value of the Electric to the large manufacturer on the short haul.

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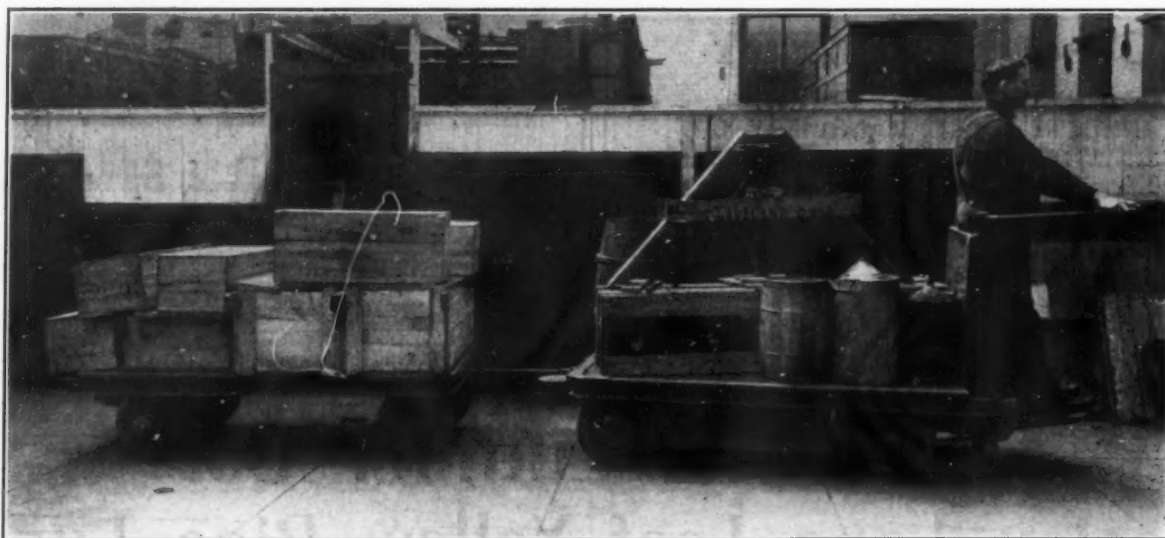
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When the crops begin to move, your facilities will be strained to the breaking point. Anticipate the increased business that is coming and equip your plant with an Electric Storage Battery Industrial Truck.



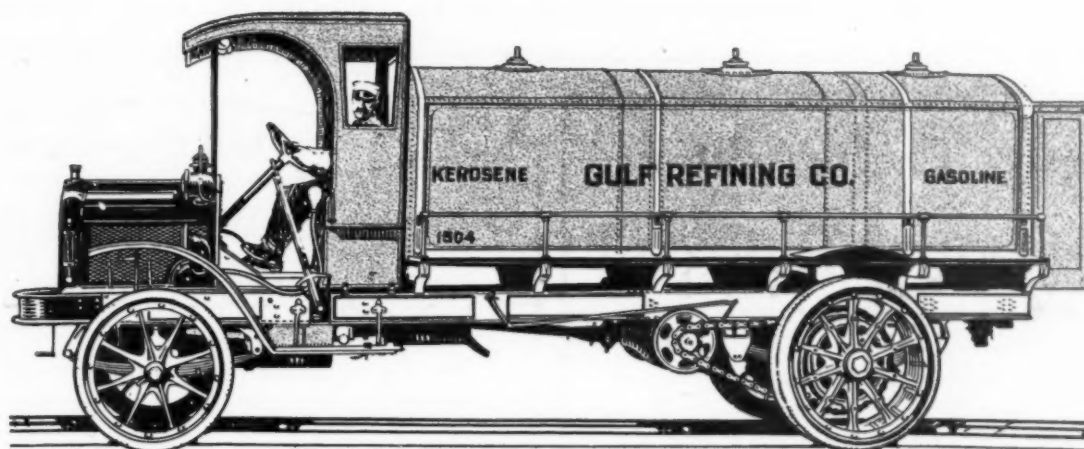
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The great oil companies of America were one of the first big lines of business to use motor trucks extensively. Naturally then, these companies are probably more familiar with the good and bad points of the various motor trucks than any other important line of business. The great oil companies know motor trucks by long experience.

In June, 1913, the great oil companies operated a total of 150 White Trucks.

In June, 1914, these same oil companies had increased their White Truck equipment to more than 270, an increase of over one hundred and twenty White Trucks during the past twelve months.

THESE FIGURES SPEAK FOR THEMSELVES

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Both in Quantity and Value of Production, the Largest Manufacturers
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Attractive Factory Sites ON THE Illinois Central Railroad

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Free books of information on farm lands issued by the
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Offers excellent locations for

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Will be glad to confer with
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excellent location for hosiery
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now ready for machinery.
Healthful location, ample
supply of labor, citizens of
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To the MANUFACTURER and DISTRIBUTOR

Abundant supplies of coal, coke, iron, timber and
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Cheap electric power, numerous undeveloped water-
powers, good home markets and excellent shipping
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ideal.

Many of the cities on the Central of Georgia Railway
occupy advantageous positions for distributing ware-
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Full and detailed information upon application.

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Glass Sands of West Virginia

Exceptional Purity

Extensive Supply



ONE OF WEST VIRGINIA'S MODERN GLASS PLANTS

The glass sands of West Virginia are noted for their exceptional purity and adaptability to the manufacture of the finest grade of products.

In 1909 the output from its glass sand deposits was 170,000 tons, and while West Virginia was the third State in the amount of production, it was second in the value of output, thus bearing out the claims made for its purity.

West Virginia also possesses large deposits of practically chemically pure limestones and an abundance of natural gas.

Consequently there is found within its borders all of the principal raw materials and cheapest fuel for the operation of glass industries.

These statements are borne out by reference to the report of the West Virginia Geological Survey, which states:

"West Virginia, on account of its natural gas fuel, has become one of the leading glass manufacturing States, and these plants are scattered all through its natural gas district. In the State is found one of the purest limestones in the country, which is especially crushed at Martinsburg to supply this trade. This State also at a number of places has almost inexhaustible deposits of pure glass sand."

Combine with these requirements a railroad service such as furnished by the Baltimore and Ohio, passing not only through the heart of the glass sand, limestone and natural gas districts of West Virginia, but also reaching into the leading markets East, West and North, and it is readily seen that West Virginia provides an ideal location for glass industries.

The Baltimore & Ohio Railroad, through its Industrial Department, will furnish information and co-operate with those desiring to establish glass industries in West Virginia.

Baltimore & Ohio Railroad

J. H. STEWART, Agricultural Agent
Morgantown, W. Va.

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FLORIDA

Its Resources and Its Future

In a striking interview in the Jacksonville (Florida) Times Union, Richard H. Edmonds, Editor of the Manufacturers Record, summed up interesting and valuable facts regarding the resources of this State, its splendid progress and wonderful possibilities.

Read the following extracts from this interview:

"Florida is destined to be one of the most cosmopolitan States in the Union. By virtue of the fact that people from all sections of the United States and a good many intelligent, progressive people from other lands are settling here, this State will have the advantage that arises from the commingling of the highest type of citizenship coming from other States and other lands."

"It is an unusual opportunity which Florida enjoys of developing the highest type of citizenship in the country. It is the last State in the Union which can ever have conditions exactly like those to be found here. Other States have long ago passed through that period of a great rush of population similar to that upon which Florida is just entering. Texas, Oklahoma and the Pacific coast States years ago had the opportunity of bringing together men of energy and virility from other sections, but Florida's opportunity is even greater than was theirs because of the larger development of the whole country and the unique position which Florida holds as the winter playground and the winter home of tens of thousands of leading men of affairs of the whole country."

"Into Florida are coming many thousands of people of standing and position, of education and character, and many of them people of means who here find ideal conditions for living."

"Some are coming because of Florida's climatic advantages, some are coming because they want to escape the biting blizzards of the North and West, some are coming because of business opportunities in agriculture and in manufactures, and some are coming because they realize that in a rapidly growing State, where the best class of population is increasing as here, opportunities are more numerous than in older communities."

"Florida's climate is an asset just as tangible and real as Alabama's coal and iron."

"Florida has great agricultural potentialities for diversified farming and cattle raising, as well as for trucking and citrus fruit industry."

"It is the world's best citrus fruit region."

"It is a State of great manufacturing potentialities."

"Its ports will marvelously expand in trade and commerce with the opening of the Panama Canal. Indeed, they would continue to expand even if there were no Panama Canal in sight, but with that nearing completion these ports will become world centers of commerce."

"And yet greater as a tangible asset for the making of a State, Florida's climate surpasses in value its agricultural or manufacturing potentialities and the possibilities for the future commerce of its ports."

"More and more as the years go by people of means and even those of very moderate circumstances, who can possibly do so, are seeking to escape the hardships of the winters of the North and West. Every biting blast of the blizzards that sweep over Canada and the North and the West are whistling the story of Florida's climate and driving before them the people who can escape to Florida."

"What California, with its amazing development, has been to the central West in years past, Florida will be to the entire country east of the Mississippi River for years to come. Less than a quarter of a century ago Los Angeles had 50,000 people. It now has a population of about 400,000, and its wealth is so great that it was recently able to celebrate the completion of an aqueduct costing \$23,000,000, built to bring water from a mountain region 250 miles away. Los Angeles is typical of California's development."

"What has been done in Los Angeles and California can and should be done in Florida. The advantages of this State are greater than those of California. Its nearness to the center of population of the whole East and South and central West gives it an added advantage of great importance."

"It is within the power of the people of Florida and the railroads working in co-operation to more than duplicate in this State the truly amazing development which has made California one of the wonders of the world. It should always be borne in mind by the owners of Florida's railroads and by the people of the State that the resources here are greater than California's, that the climatic advantages are far superior, and that the geographical location with relation to the population of this country and to the world's activities are also better than California's."

Information on any Phase of Florida's Resources and Opportunities for Industrial, Commercial or Agricultural Expansion will be gladly furnished.

FLORIDA EAST COAST RAILWAY

J. E. INGRAHAM, Vice-President

ST. AUGUSTINE, FLA.

Commercial Dairying Along the Clinchfield

Fortune waits to fill the hands of the men who go into the dairying business on a commercial basis on the line of the Carolina, Clinchfield & Ohio Railway.

Along most of its entire length conditions of soil, climate and transportation combine to render it ideal for furnishing to the market large quantities of butter at production-cost not easily met by competitors elsewhere.



A DAIRY HERD IN THE CLINCHFIELD TERRITORY.

The high lands traversed by the road are natural grass lands, producing abundantly of certain of the most nutritive kinds as soon as the timber is cleared away so that the sun can warm the soil. Other kinds must be planted, but yield equally well where given the opportunity.

Corn, wheat, oats, rye, barley—all these grains grow readily and yield largely throughout the entire territory.

The summers are long, owing to the latitude, but mild because of the altitude; the winters are short and not rigorous, and cows can graze in comfort during practically all the months of the year. This keeps them healthy, and lessens the cost as well. The construction of barns for them is rendered cheap by reason of the cheapness of lumber, as well as by the fact that they need not be made so warm as is necessary farther North.

There is an abundance of running water—clear, pure, sparkling—during the entire year. Every farm can have its own streams fed by never-failing mountain springs.

The Carolina, Clinchfield & Ohio Railway, through its connections with the Louisville & Nashville and the Chesapeake & Ohio, the Norfolk & Western, the Southern and the Seaboard Air Line Railways, puts this entire section in easy touch with the best markets of the country—North, South, East and West—and in these markets there is a continually increasing demand for first-class dairy butter.

*Write for a copy of the booklet, "The Land of Opportunities,"
issued by the Industrial Department of the road.*

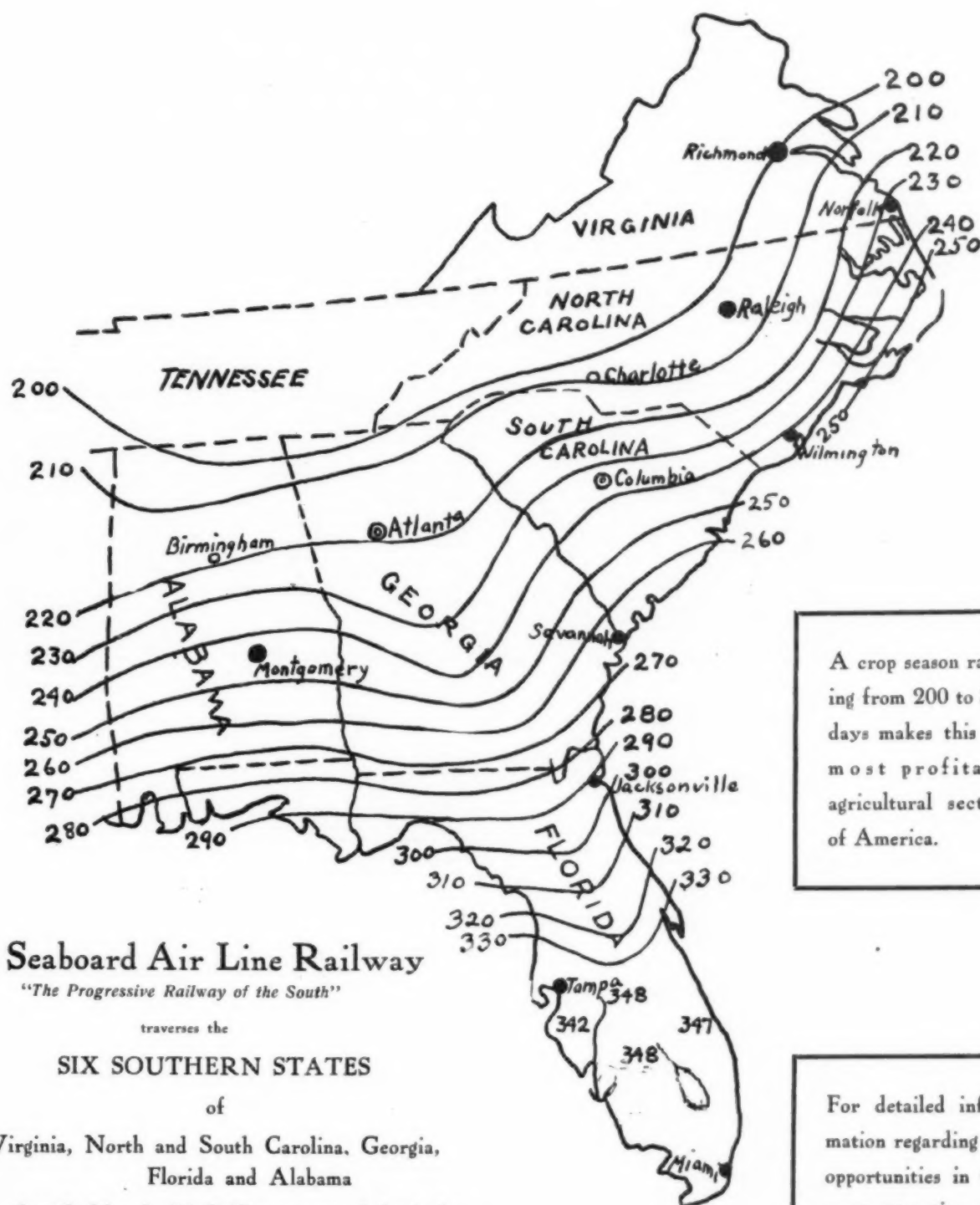
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in the territory served by the
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"The Progressive Railway of the South"



A crop season ranging from 200 to 348 days makes this the most profitable agricultural section of America.

The Seaboard Air Line Railway

"The Progressive Railway of the South"

traverses the

SIX SOUTHERN STATES

of

Virginia, North and South Carolina, Georgia,
Florida and Alabama

described by the U. S. Department of Agriculture

as the

"GREAT WINTER GARDEN OF THE SOUTH"

The lines and figures show, in days, the average length of crop-growing season in various parts of each of the six states as reported by the United States Weather Bureau

For detailed information regarding the opportunities in this most attractive area—address

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General Industrial Agent
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Vilter Mfg. Co., Milwaukee, Wis.
- Brick. (Acid.)**
Hood Brick Co., B. Mifflin, Atlanta, Ga.
- Brick. (Building.)**
Am. Enamelled Brick & Tile Co., New York, N. Y.
Brookhaven Pressed Brick & Mfg. Co., Brookhaven, Miss.
Dixie Brick & Tile Co., Peryear, Tenn.
Harrison-Walker Refractories Co., Pittsburgh, Pa.
Kilian Fireproofing & Brick Works, Killian, S. O.
Louisville Fire Brick Works, Highland Park, Ky.
Mexico Brick & Fire Clay Co., Mexico, Mo.
Pomona Terra-Cotta Co., Pomona, N. O.
Standard Brick Co., Macon, Ga.
Stevens' Sons Co., H., Macon, Ga.
Union Mining Co., Mt. Savage, Md.
- Brick. (Enamelled.)**
Am. Enamelled Brick & Tile Co., New York, N. Y.
- Brick. (Fire.)**
Brookhaven Pressed Brick & Mfg. Co., Brookhaven, Miss.
Dixie Brick & Tile Co., Peryear, Tenn.
Harrison-Walker Refractories Co., Pittsburgh, Pa.
Kilian Fireproofing & Brick Works, Killian, S. O.
Louisville Fire Brick Works, Highland Park, Ky.
Mexico Brick & Fire Clay Co., Mexico, Mo.
Pomona Terra-Cotta Co., Pomona, N. O.
Standard Brick Co., Macon, Ga.
Stevens' Sons Co., H., Macon, Ga.
Union Mining Co., Mt. Savage, Md.
- Brick. (Magnesia.)**
Harrison-Walker Refractories Co., Pittsburgh, Pa.
- Brick. (Paving.)**
Carlyle Paving Brick Co., Portsmouth, O.
Copeland-Ingalls Shale Brick Co., Birmingham, Ala.
Dunn Wire-Out-Lug Brick Co., Oconnet, Ohio
Southern Clay Mfg. Co., Chattanooga, Tenn.
Standard Brick Co., Macon, Ga.
- Brick. (Silica.)**
Dixie Brick & Tile Co., Peryear, Tenn.
Harrison-Walker Refractories Co., Pittsburgh, Pa.
- Brick and Clayworking Machinery and Supplies.**
Chase Fdry. & Mfg. Co., Columbus, O.
Farnholtz Brick Machinery Co., St. Louis, Mo.
Freese & Co., E. M., Gallon, O.
Steele & Sons, J. O., Stateville, N. O.
- Bridges. (Concrete.)**
Luten, Daniel B., Indianapolis, Ind.
Requarth Co., O. W., Charlotte, N. O.
Turner, O. A. P., Minneapolis, Minn.
- Bridges. (Rolling Lift.)**
Scherzer Rolling Lift Bridge Co., Chicago, Ill.
- Bridges. (Steel.)**
American Bridge Co. of New York, N. Y.
Austin Bros., Atlanta, Ga.
Belmont Iron Works, Philadelphia, Pa.
Champion Bridge Co., Washington, Ohio.
Chicago Bridge & Iron Works, Chicago, Ill.
East St. Louis Bridge Co., East St. Louis, Ill.
Oregon Bridge Co., Lebanon, Ohio.
Richmond Structural Steel Co., Richmond, Va.
Scherzer Rolling Lift Bridge Co., Chicago, Ill.
Vincennes Bridge Co., Vincennes, Ind.
Virginia Bridge & Iron Co., Roanoke, Va.
- Bridge and Structural Iron Paints.**
Chattanooga Paint Co., Chattanooga, Tenn.
- Brimstone.**
Union Sulphur Co., New York, N. Y.
- Brushes.**
Felton Brush Co., D. D., The, Atlanta, Ga.
- Buckets. (Bottom-dumping for Concrete, Fertilizer, etc.)**
Stuebner Iron Works, G. L., Long Island City, N. Y.
- Buckets. (Clam Shell, Orange Peel, etc.)**
Hayward Company, New York, N. Y.
Williams Company, G. H., Cleveland, Ohio.
- Buckets. (Dredging, Excavating, Sewer, etc.)**
Hayward Co., New York, N. Y.
Monaghan Mch. Co., Chicago, Ill.
Williams Co., The G. H., Cleveland, O.
- Buckets. (Grab.)**
Hunt Co., Inc., C. W., West New Brighton, N. Y.
- Buckets. (Ore Handling.)**
Caldwell & Son Co., H. W., Chicago, Ill.
Hayward Co., New York, N. Y.
Link-Belt Co., Nicetown (Philadelphia) Pa.
Williams Co., The G. H., Cleveland, O.
- Buhr Stones.**
Starr Co., B. F., Baltimore, Md.
- Builders and Contractors.**
Austin Bros., Atlanta, Ga.
Caldwell-Wingate Co., Atlanta, Ga.
Selden-Breck Construction Co., St. Louis, Mo.
Stone & Webster Eng. Corp., Boston, Mass.
Turner, O. A. P., Minneapolis, Minn.
White Companies, J. G., New York, N. Y.
- Building Stone.**
Bedford Steam Stone Works, Bedford, Ind.
- Building Supplies.**
Harris Bros. Co., Chicago, Ill.
Southern Building Material Co., Norfolk, Va.
- Burners. (Enclosed Flame Case.)**
Oven Equipment & Mfg. Co., The, New Haven, Conn.
- Burners. (Oil.) [See Fuel Oil Equipments.]**
- Bushings. (Oilless, for Loose Pulleys.)**
Metalline Co., Long Island City, N. Y.
- Cables.**
American Steel & Wire Co., Chicago, Ill.
Broderick & Bascom Rope Co., St. Louis, Mo.
Roebbing's Sons Co., John A., Trenton, N. J.
- Cables. (Underground.)**
American Steel & Wire Co., Chicago, Ill.
- Cables and Wires. (Insulated.)**
Safety Insulated Wire & Cable Co., New York, N. Y.
- Cableways. (Overhead Suspension.)**
American Steel & Wire Co., Chicago, Ill.
Broderick & Bascom Rope Co., St. Louis, Mo.
Consolidated Tramway Co., New York, N. Y.
Flory Mfg. Co., S., Bangor, Pa.
Lidgerwood Mfg. Co., New York, N. Y.
Roebbing's Sons Co., John A., Trenton, N. J.
- Can and Box Making Machinery. (Tin.)**
Bliss Co., E. W., Brooklyn, N. Y.
- Canning Machinery and Supplies.**
Robins & Co., A. K., Baltimore, Md.
Sprague Canning Machinery Co., Chicago, Ill.
- Caps. (Roofing.)**
Robertson Steel & Iron Co., W. F., Cincinnati, O.
- Carborundum Paper and Cloth.**
Carborundum Co., Niagara Falls, N. Y.
- Cars. (Dump, Industrial, Logging and Mine.)**
Austin Mfg. Co., Chicago, Ill.
Chase Fdry. & Mfg. Co., Columbus, O.
Curd, Geo. B., Cincinnati, Ohio
Easton Car & Construction Co., Easton, Pa.
Electric Wheel Co., Quincy, Ill.
Georgia Car & Locomotive Co., Atlanta, Ga.
Hunt Co., O. W., Inc., West New Brighton, N. Y.
Oliver Mfg. Co., Wm. J., Knoxville, Tenn.
Western Wheel Scraper Co., Aurora, Ill.
- Cars. (Motor, Gasoline.)**
White Co., The, Cleveland, Ohio.
- Cars. (Passenger and Freight.) [See Railroad Equipment and Supplies.]**
- Car Wheels, Axles and Trucks.**
Carnegie Steel Co., Pittsburgh, Pa.
Oliver Mfg. Co., Wm. J., Knoxville, Tenn.
- Cast Iron Pipe. (See Pipe.) [Cast Iron.]**
- Castings. (Aluminum.)**
Aluminum Company of America, Pittsburgh, Pa.
- Castings. (Brass and Bronze.)**
McKenna Bros. Brass Co., Pittsburgh, Pa.
Triumph Electric Co., Cincinnati, O.
- Castings. (Gray Iron.)**
Columbian Iron Works, Chattanooga, Tenn.
Georgia Car & Locomotive Co., Atlanta, Ga.
Giamorgan Pipe & Foundry Co., Lynchburg, Va.
Lynchburg Foundry Co., Lynchburg, Va.
Pooles Iron Works Co., Meadville, Pa.
U. S. Cast Iron Pipe & Fdry. Co., Burlington, N. J.
Valh & Murdoch Iron Works, Charleston, S. C.
Westbrook Elevator Co., Danville, Va.
- Castings. (Malleable Iron and Steel.)**
Columbus Malleable Co., Columbus, Ohio.
General Malleable Co., Warren, O.
Marion Malleable Iron Works, The, Marion, Ind.
Missouri Malleable Iron Co., East St. Louis, Ill.
- Castings. (Municipal.)**
Chickasaw Iron Work, Memphis, Tenn.
- Castings. (Steel.)**
Allen American Manganese Steel Co., Edgar, Chicago, Ill.
Crucible Steel Castings Co., Lansdowne, Pa.
Hoffman & Co., Inc., R. O., Baltimore, Md.
Phoenix Iron Works Co., Meadville, Pa.
Riverside Steel Casting Co., Newark, N. J.
- Ceilings. (Metal.)**
Edwards Manufacturing Co., Cincinnati, O.
Keighly Metal Cell. & Mfg. Co., S., Pittsburgh, Pa.
Milwaukee Artistic Metal Ceiling Co., Milwaukee, Wis.
Milwaukee Corrugating Co., Milwaukee, Wis.
Moesch-Edwards Corrugating Co., Covington, Ky.
- Cement.**
Cinchfield Portland Cem. Corp., Kingsport, Tenn.
Dixie Portland Cement Co., Chattanooga, Tenn.
Hartman Cement Co., Wm. G., Philadelphia, Pa.
Kirkpatrick Sand & Cement Co., Birmingham, Ala.
Kosmos Portland Cement Co., Inc., Louisville, Ky.
Lehigh Portland Cement Co., Allentown, Pa.
Security Cement & Lime Co., Hagerstown, Md.
Southern States Portland Cem. Co., Rockmart, Ga.
Standard Portland Cement Co., Leeds, Ala.
- Cement Machinery.**
Aising Engineering Co., J. R., New York, N. Y.
Power & Mining Machinery Co., Oudaby, Wis.
Raymond Bros. Impact Pulv. Co., Chicago, Ill.
- Central American Trade.**
El Comercio, New York, N. Y.
- Chains. (Dredge, Quarry, Steam Shovel.)**
Weimer Chain & Iron Co., Lebanon, Pa.
- Chemists. (Analytical and Consulting.)**
Davis, Geo. C., Philadelphia, Pa.
Froehling & Robertson, Richmond, Va.
Hunt & Co., Robt. W., Chicago, Ill.
Pittsburgh Testing Laboratory, Pittsburgh, Pa.
Wiley & Co., Baltimore, Md.
- Chloride Accumulator.**
Electric Storage Battery Co., The, Philadelphia, Pa.
- Chucks.**
Morse Twist Drill & Mch. Co., New Bedford, Mass.
- Cities and Towns. (Commercial and Industrial Opportunities.) [See Industrial, Agricultural and Commercial Opportunities.]**
- Clamps. (For Concrete Forms.)**
Sterling Wheelbarrow Co., Milwaukee, Wis.
- Clayworking Machinery. [See Brick and Clayworking Machinery and Supplies.]**
- Cleansing Compound. (Floors, Etc.)**
India Alkali Works, Boston, Mass.
- Clocks. (Watchman.)**
Watchman's Clock & Supply Co., New York, N. Y.
- Clutches. (Friction.)**
Medart Patent Pulley Co., St. Louis, Mo.
Moore & White Co., The, Philadelphia, Pa.
- Coal.**
Cinchfield Coal Corp., Dante, Va.
Cinchfield Fuel Co., Spartanburg, S. C.
Consolidation Coal Co., Inc., New York, N. Y.
Tennessee Coal, Iron & R. R. Co., B'm'gh'm, Ala.
- Coal Cutters.**
Jeffrey Mfg. Co., Columbus, O.
- Coal Handling Machinery.**
Bartlett & Snow Co., C. O., Cleveland, O.
Guarantee Construction Co., New York, N. Y.
Hayward Co., New York, N. Y.
Hunt Co., C. W., Inc., West New Brighton, N. Y.
Jeffrey Mfg. Co., Columbus, O.
Link-Belt Co., Nicetown (Philadelphia) Pa.
Stuebner Iron Works, G. L., Long Island City, N. Y.
Weimer Mfg. Co., Chicago, Ill.
- Coal Tar and By-Products.**
Barrett Mfg. Co., Philadelphia, Pa.
- Coal Tipples.**
American Bridge Co. of New York, N. Y.
- Coke.**
Tennessee Coal, Iron & R. R. Co., B'm'gh'm, Ala.
- Colleges and Schools.**
Rensselaer Polytechnic Institute, Troy, N. Y.
- Colleges. (Technical.)**
Rensselaer Polytechnic Institute, Troy, N. Y.
- Columns. (Porch, Interior, Pergola.)**
Nickerson Mfg. Co., Knoxville, Tenn.
- Concrete Construction. (Reinforced.)**
Berry-Fortune Construction Co., Eatonton, Ga.
Foster-Dreighthon-Gould Co., Nashville, Tenn.
Guarantee Construction Co., New York, N. Y.
Jeffrey Mfg. Co., Columbus, O.
Requarth Co., O. W., Charlotte, N. O.
Sweets Steel Co., Williamsport, Pa.
Trussed Concrete Steel Co., Youngstown, O.
Turner, O. A. P., Minneapolis, Minn.
- Concrete Products.**
Gray Concrete Co., Thomasville, N. C.
- Concrete Curb Protector. (Steel.)**
Steel Protected Concrete Co., Philadelphia, Pa.
- Concrete Mixers. [See Mixers. (Concrete.)]**
- Concrete Reinforcing Bars.**
Bourne-Fuller Co., The, Cleveland, Ohio.
Carnegie Steel Co., Pittsburgh, Pa.
Gulf States Steel Co., Birmingham, Ala.
Hoffman & Co., R. O., Baltimore, Md.
Jones & Laughlin Steel Co., Pittsburgh, Pa.
Lackawanna Steel Co., Lackawanna, N. Y.
Laclede Steel Co., St. Louis, Mo.
Republic Iron & Steel Co., Youngstown, O.
Trussed Concrete Steel Co., Youngstown, O.
- Concrete Reinforcing Bar Couplings.**
Marion Malleable Iron Works, Marion, Ind.
- Concrete Reinforcing Wire and Wire Fabric.**
Aronstam Co., L., Columbia, S. C.
Roebbing's Sons Co., John A., Trenton, N. J.
- Condensers.**
Alberger Pump & Condenser Co., New York, N. Y.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Oreson-Morris Co., Philadelphia, Pa.
Dean Bros., Steam Pump Wks., Indianapolis, Ind.
Westinghouse Machine Co., Pittsburgh, Pa.
York Mfg. Co., York, Pa.
- Conductor Pipe.**
Edwards Mfg. Co., Cincinnati, O.
Hussey & Co., C. G., Pittsburgh, Pa.
Milwaukee Artistic Metal Ceiling Co., Milwaukee, Wis.
Milwaukee Corrugating Co., Milwaukee, Wis.
- Contractors. (Concrete.)**
Berry-Fortune Construction Co., Eatonton, Ga.

- Contractors.** (Hydro-Electric Developments.)
Requarth Co., O. W., Charlotte, N. C.
- Contractors.** (Water Supply.)
Layne & Bowler Co., Houston, Tex.
- Contractor's Machinery and Supplies.** [See also Hoisting Machinery.]
American Clay Machinery Co., The, Bucyrus, Ohio.
American Hoist & Derrick Co., St. Paul, Minn.
American Locomotive Co., New York, N. Y.
Austin Mfg. Co., Chicago, Ill.
Bryer Mach. Co., The John F., Ravenna, O.
Contractors' Service Co., New York, N. Y.
Cord, Geo. B., Cincinnati, O.
Flory Mfg. Co., S., Bangor, Pa.
Hyde Bros. Steel & Rail Co., Pittsburgh, Pa.
Marine Metal & Supply Co., New York, N. Y.
Milburn Co., Alex. N., Baltimore, Md.
Monaghan Mch. Co., Chicago, Ill.
National Hoisting Engine Co., Harrison, N. J.
Oliver Mfg. Co., Wm. J., Knoxville, Tenn.
Pipe & Contractor's Supply Co., New York, N. Y.
Sherwood, E. C., New York, N. Y.
Southern Mch. & Equipment Co., Lynchburg, Va.
Sterling Machinery Co., New York, N. Y.
- Conveying and Elevating Machinery.**
Bartlett & Snow Co., O. O., Cleveland, O.
Caldwell & Son Co., Chicago, Ill.
Consolidated Tramway Co., New York, N. Y.
Flory Mfg. Co., S., Bangor, Pa.
Guarantee Construction Co., New York, N. Y.
Hunt Co., C. W., Inc., West New Brighton, N. Y.
Jeffrey Mfg. Co., Columbus, O.
Lidgerwood Mfg. Co., New York, N. Y.
Link-Belt Co., Nicetown, (Philadelphia) Pa.
Mathews Gravity Carrier Co., Ellwood City, Pa.
McLachlan-Stone Mach. Co., Hollidaysburg, Pa.
Weller Mfg. Co., Chicago, Ill.
- Cooperage Stock and Box Shook Machinery.**
Garlich Co., Peter, Cleveland, O.
- Coppersmiths.**
Hoffman-Ablers Co., Cincinnati, Ohio.
McMillan Bros., Jacksonville, Fla.
- Cordage.**
Broderick & Bascom Rope Co., St. Louis, Mo.
Columbian Rope Co., Auburn, N. Y.
Plymouth Cordage Co., North Plymouth, Mass.
Waterbury Co., New York, N. Y.
- Core Ovens.**
Oven Equipment & Mfg. Co., The, New Haven, Conn.
- Corner Bead.** (Metal.)
Penn Metal Co., Boston, Mass.
- Corn-Mill Machinery.**
Kortyke & Marmon Co., Indianapolis Ind.
Raymond Bros. Impact Pulv. Co., Chicago, Ill.
Sarr Co., B. F., Baltimore, Md.
Wolf Co., Chambersburg, Pa.
- Cotton Oil and Products.**
American Cotton Oil Co., New York, N. Y.
- Cotton Yarns.** (Commission Merchants.)
Paulson, Linkroom & Co., New York, N. Y.
- Cotton-Gin Machinery.**
Carver Cotton Gin Co., East Bridgewater, Mass.
Continental Gin Co., Birmingham, Ala.
Gibbes Machinery Co., Inc., Columbia, S. C.
Murray Co., The, Atlanta, Ga.
- Cotton-Mill Machinery.**
Draper Co., Hopedale, Mass.
Hanson Machine Works, Taunton, Mass.
Saco-Lowell Shop, Boston, Mass.
Whitinsville Spin'g Ring Co., Whitinsville, Mass.
- Cotton-Mill Supplies.**
American Supply Co., Providence, R. I.
Whitinsville Spin'g Ring Co., Whitinsville, Mass.
- Cottonseed-Oil Machinery.**
Buckeye Iron & Brass Works, Dayton, O.
Burruss Engineering Co., Atlanta, Ga.
Cardwell Machine Co., Richmond, Va.
Carver Cotton Gin Co., East Bridgewater, Mass.
Continental Gin Co., Birmingham, Ala.
French Oil Mill Machinery Co., Figma, O.
Murray Co., The, Atlanta, Ga.
Raymond Bros. Impact Pulv. Co., Chicago, Ill.
- Counting and Weighing Machines.** (For Industrial Plants.)
National Scale Co., Chicopee Falls, Mass.
- Couplings.**
American Spiral Pipe Works, Chicago, Ill.
Golden's Foundry & Machine Co., Columbus, Ga.
Wood's Sons Co., T. B., Chambersburg, Pa.
- Couplings.** (Car.)
National Tube Co., Pittsburgh, Pa.
Weimer Chain & Iron Co., Lebanon, Pa.
- Couplings.** (Hose, Air, Gas, Steam and Water.)
National Tube Co., Pittsburgh, Pa.
- Couplings.** (For Reinforcing Bars.)
Marion Malleable Iron Works, Marion, Ind.
- Coverings.** (Pipe, Boiler, etc.)
Johns-Manville Co., H. W., New York, N. Y.
Southern Asbestos Mfg. Co., Inc., Richmond, Va.
- Cranes.** (Locomotive.)
American Hoist & Derrick Co., St. Paul, Minn.
Ohio Locomotive Crane Co., Bucyrus, O.
- Cranes.** (Traveling, Hand, Power, Hydraulic.)
Lane Mfg. Co., Montpelier, Vt.
Speidel, J. G., Reading, Pa.
- Crayons.**
Georgia Talc Co., Asheville, N. C.
Lowell Crayon Co., Lowell, Mass.
- Crosscutting Equipment.**
Casey-Hedges Co., Chattanooga, Tenn.
Struthers-Wells Co., Warren, Pa.
Walsh & Welder Boiler Co., Chattanooga, Tenn.
- Crosscutting Works.**
American Crosscut Works, New Orleans, La.
Internat'l Crosscut & Cons. Co., Galveston, Tex.
National Lumber & Cross. Co., Texarkana, Ark.
Southern Crosscutting Co., Ltd., Slidell, La.
Southern Wood Preserving Co., Atlanta, Ga.
- Crossarms and Pins.**
Western Electric Co., New York, N. Y.
- Crossarms.** (Crossed.)
American Crosscut Works, New Orleans, La.
Internat'l Crosscut & Cons. Co., Galveston, Tex.
National Lumber & Crosscutting Co., Texarkana, Ark.
Southern Crosscutting Co., Ltd., Slidell, La.
Southern Wood Preserving Co., Atlanta, Ga.
- Crossings.** [See Railroad Frogs and Switches.]
- Crosstie Machine.**
Standard Portable Saw Mill Co., New Orleans, La.
- Crossties.** (Crossed.)
American Crosscut Works, New Orleans, La.
Internat'l Crosscut & Cons. Co., Galveston, Tex.
National Lumber & Cross. Co., Texarkana, Ark.
Southern Crosscutting Co., Ltd., Slidell, La.
Southern Wood Preserving Co., Atlanta, Ga.
- Crossities.** (Steel.)
Carnegie Steel Co., Pittsburgh, Pa.
- Crushed Stone.**
American Ballast Co., Knoxville, Tenn.
Balfour Quarry Co., Asheville, N. C.
Chickamauga Quarry & Construction Co., Chattanooga, Tenn.
Kirkpatrick Sand & Cement Co., Birmingham, Ala.
Western Brook Quarry Co., Columbia, S. C.
- Crushers.** (Corn and Cob.)
Gruender Pat. Crusher & Pulv. Co., St. Louis, Mo.
Jeffrey Mfg. Co., Columbus, O.
Raymond Bros. Impact Pulv. Co., Chicago, Ill.
- Crushers.** (Rock.)
Austin Mfg. Co., Chicago, Ill.
Buchanan Co., Inc., C. G., New York, N. Y.
Power & Mining Machinery Co., Cudahy, Wis.
Raymond Bros. Impact Pulv. Co., Chicago, Ill.
Universal Road Mch. Co., Kingston, N. Y.
Western Wheelbarrow Co., Aurora, Ill.
Wheeling Mold & Fdry. Co., Wheeling, W. Va.
- Crushing and Pulverizing Machinery.**
Aising Engineering Co., J. R., New York, N. Y.
Austin Mfg. Co., Chicago, Ill.
Bartlett & Snow Co., C. O., Cleveland, O.
Buchanan Co., Inc., C. G., New York, N. Y.
Gruender Pat. Crusher & Pulv. Co., St. Louis, Mo.
Jeffrey Mfg. Co., Columbus, O.
McLachlan-Stone Mach. Co., Hollidaysburg, Pa.
Raymond Bros. Impact Pulv. Co., Chicago, Ill.
Stedman's Foundry & Machine Works, Aurora, Ind.
Western Wheelbarrow Co., Aurora, Ill.
Wheeling Mold & Fdry. Co., Wheeling, W. Va.
- Culvert Pipe.** (Cast Iron.)
American Cast Iron Pipe Co., Birmingham, Ala.
Clow & Sons, James B., Chicago, Ill.
Donaldson Iron Co., Evans, Pa.
Glaucoogan Pipe & Foundry Co., Lynchburg, Va.
Lynchburg Foundry Co., Lynchburg, Va.
Massillon Iron & Steel Co., Massillon, Ohio.
Standard Cast Iron Pipe & Foundry Co., Bristol, Pa.
Wood & Co., R. D., Philadelphia, Pa.
- Culverts.** (Corrugated Metal.)
American Sheet & Tin Plate Co., Pittsburgh, Pa.
Armco Culvert Fabricating Bureau, Cincinnati, O.
Atlas Metal Works, Dallas, Tex.
Birmingham Metal Products Co., Birmingham, Ala.
Canton Culvert Co., The, Canton, O.
Dixie Culvert & Metal Co., Atlanta, Ga.
Gallon Iron Works & Mfg. Co., The, Gallon, Ohio.
Harry Bros. Co., Newport, Ky.
Lone Star Culvert Co., Houston, Tex.
Moeschel-Edwards Corrugating Co., Covington, Ky.
National Corrugated Culvert Mfg. Co., Warren, Pa.
New Orleans Roofing & Metal Wks., New Orleans, La.
Salisbury Metal Culvert Co., Inc., Salisbury, N. C.
Tennessee Metal Culvert Co., Nashville, Tenn.
Virginia Metal & Culvert Co., Inc., Roanoke, Va.
- Culverts.** (Vitrified Pipe.)
Bibb Sewer Pipe Co., Macon, Ga.
Southern Sewer Pipe Co., Birmingham, Ala.
Stevens Sons Co., H., Macon, Ga.
- Cupola Furnaces.**
Paxson Co., J. W., Philadelphia, Pa.
- Curbings.** (Granite.)
Byrd Bros., Salisbury, N. C.
- Curb Protector.** (Steel.)
Steel Protected Concrete Co., Philadelphia, Pa.
- Cuts.** (Half-ton, Line, etc.)
Baltimore-Md. Engraving Co., Baltimore, Md.
- Cutter Heads.** (Woodworking.)
Shimer & Sons, Samuel J., Milton, Pa.
- Cutter Grinders.**
Vitrified Wheel Co., Westfield, Mass.
- Cutting.** (Oxy-Acetylene Process.)
Prest-O-Lite Co., Inc., The, Indianapolis, Ind.
- Dams.** (Reinforced Concrete.)
Berry-Fortune Construction Co., Eatonton, Ga.
- Derricks and Derrick Fittings.**
American Hoist & Derrick Co., St. Paul, Minn.
Byers Mach. Co., The John F., Ravenna, O.
Hayward Co., The, New York, N. Y.
Monaghan Machine Co., Chicago, Ill.
Saugen Derrick Co., Chicago, Ill.
- Designers and Illustrators.** (Printed Matter.)
Baltimore, Md. Engraving Co., Baltimore, Md.
- Distilling Apparatus.**
Hoffman-Ablers Co., Cincinnati, Ohio.
- Ditching Machinery.**
American Hoist & Derrick Co., St. Paul, Minn.
American Locomotive Co., New York, N. Y.
Fairbanks Steam Shovel Co., Marion, O.
Gade Excavating Co., The, Iowa Falls, Iowa.
Hayward Co., The, New York, N. Y.
Marion-Osgood Co., Marion, O.
Marion Steam Shovel Co., Marion, O.
Monaghan Machine Co., Chicago, Ill.
Williams Co., The, G. H., Cleveland, O.
- Doors.** (Steel Rolling.)
Kinross Mfg. Co., Columbus, O.
- Doors.** (Tin Clad.)
Victor Mfg. Co., Newburyport, Mass.
- Doors, Sash and Blinds.**
Columbus Iron Works, Columbus, Ga.
- Draftsmen's Supplies.**
Weber & Co., F., Philadelphia, Pa.
- Dredge Chains.**
Weimer Chain & Iron Co., Lebanon, Pa.
- Dredge Cutters.**
Norborn Engineering Co., Philadelphia, Pa.
- Dredges.** [See Excavating Machinery.]
- Drills.** (Electric.)
Fort Wayne Electric Works, Fort Wayne, Ind.
- Drills.** (Pneumatic.) [See also Drills Rock and Mining.]
- Drills.** (Prospecting.)
Fort Wayne Electric Works, Madison, Wis.
Keystone Steam Well Mach. Co., Beaver Falls, Pa.
- Drills.** (Rock and Mining.)
Fort Wayne Electric Works, Madison, Wis.
Independent Pneumatic Tool Co., Chicago, Ill.
Jeffrey Mfg. Co., Columbus, O.
Wickes Bros., Jersey City, N. J.
- Drills.** (Twist.)
McKenna Bros. Brass Co., Pittsburgh, Pa.
Morris Twist Drill & Mch. Co., New Bedford, Mass.
- Drive Well Points and Well Supplies.**
National Tube Co., Pittsburgh, Pa.
- Drop Forgings.**
American Spiral Pipe Works, Chicago, Ill.
- Drop Forging Machinery.**
Bliss Co. E. W., Brooklyn, N. Y.
- Dry Docks.** (Builders of)
American Bridge Co. of New York, N. Y.
- Drying Machinery.**
American Process Co., New York, N. Y.
Bailley-Lobby Co., The, Charleston, S. C.
Buffalo Forge Co., Buffalo, N. Y.
Casteeville, Boiler Works, Coatesville, Pa.
Cummer & Son Co., F. D., The, Cleveland, Ohio
Hersey Manufacturing Co., South Boston, Mass.
Ruggles-Coies Engineering Co., New York, N. Y.
Sturtevant Co., B. F., Hyde Park, Boston, Mass.
- Dry Kilns.**
Buffalo Forge Co., Buffalo, N. Y.
Moore Dry Kiln Co., L., Jacksonville, Fla.
- Dry Kiln Equipment.**
Moore Dry Kiln Co., L., Jacksonville, Fla.
- Drying Ovens.**
Oven Equipment & Mfg. Co., The, New Haven, Conn.
- Dumbwaiters.** (Hand Power.)
McKenna Bros. Brass Co., Pittsburgh, Pa.
Speidel, J. G., Reading, Pa.
- Dump Wagons and Wagon Boxes.**
Troy Wagon Works Co., Troy, O.
- Dust-Collecting Systems.**
Buffalo Forge Co., Buffalo, N. Y.
King Co., F. E., Norfolk, Va.
South Atlantic Blow Pipe & Sheet Metal Co., Savannah, Ga.
- Dynamite.** (Industrial and Agricultural.)
Atlas Powder Co., Wilmington, Del.
Du Pont De Nemours Powder Co., E. I., Wilmington, Del.
Jefferson Powder Co., Birmingham, Ala.
Keystone Nat'l Powder Co., Emporium, Pa.
- Dynamometers and Motors.**
Assets Purchasing Co., Wheeling, W. Va.
Fort Wayne Electric Works, Fort Wayne, Ind.
General Electric Co., Schenectady, N. Y.
Terry Steam Turbine Co., Hartford, Conn.
Triumph Electric Co., Cincinnati, Ohio.
Western Electric Co., New York, N. Y.
- Eaves.** (Trough.)
Edwards Mfg. Co., Cincinnati, O.
Hussey & Co. G., Pittsburgh, Pa.
Milwaukee Artistic Metal Ceiling Co., Milwaukee, Wis.
Milwaukee Corrugating Co., Milwaukee, Wis.
- Electors.** (Sewage.)
Lunkenheimer Co., The, Cincinnati, O.
Pacific Flush Tank Co., New York, N. Y.
- Electric Machinery.** (Dynamoes, Generators, Motors, etc.)
Allis-Chalmers Manufacturing Co., Milwaukee, Wis.
American Machine Co., Louisville, Ky.
Crocker-Wheeler Co., Amper, N. J.
Engberg Electric & Mechanical Works, St. Joseph, Mich.
Fairbanks-Morse & Co., Atlanta, Ga.
Fort Wayne Electric Works, Fort Wayne, Ind.
General Electric Co., Schenectady, N. Y.
Heer Engine Co., Portsmouth, O.
Lee Electric Co., Baltimore, Md.
Moore & Co., Edgar M., Pittsburgh, Pa.
Piedmont Electric Co., Asheville, N. C.
Robbins & Myers Co., Springfield, O.
Scheinert Co., E., Philadelphia, Pa.
Schroeder Electric Co., Evansville, Ind.
Sturtevant Co., B. F., Hyde Park Boston, Mass.
Triumph Electric Co., Cincinnati, O.
Wilson Mch. Co., Harold R., St. Louis, Mo.
- Electrical Contractors, Instruments and Supplies.**
Carroll Electric Co., Washington, D. C.
Crocker-Wheeler Co., Amper, N. J.
Economy Fuse & Mfg. Co., Chicago, Ill.
Fort Wayne Electric Works, Fort Wayne, Ind.
General Electric Co., Schenectady, N. Y.
Hill & Co., Walter E., Baltimore, Md.
Johns-Manville Co., H. W., New York, N. Y.
Lee Electric Co., Baltimore, Md.
Levy-Morton Co., Columbus, Ga.
Piedmont Electric Co., Asheville, N. C.
Robbins & Myers Co., Springfield, O.
- Electric Light Plants.** (Portable.)
Schroeder Electric Co., Evansville, Ind.
- Electro-Magnet.** [See Magnet Electro.]
- Electric Vehicles.**
General Vehicle Co., Long Island City, N. Y.
- Elevating, Conveying and Power Transmission Machinery.** [See also Conveying and Elevating Machinery and Power Transmission Mch.]
- Elevators.**
American Electric Machine & Elevator Co., St. Louis, Mo.
American Machine Co., Louisville, Ky.
Atlas Machine Co., Louisville, Ky.
Curran Elevator Co., James H., Cincinnati, O.
Decatur Foundry, Furnace & Mach. Co., Decatur, Ind.
Kansas City Elevator Mfg. Co., Kansas City, Mo.
Miller Elevator Mfg. Co., Wm. A., St. Louis, Mo.
Moffat Machinery Mfg. Co., Charlotte, N. C.
Ohio Elevator & Machine Co., Columbus, O.
Otis Elevator Co., New York, N. Y.
Ridgway & Son Co., The, Coatesville, Pa.
Speidel, J. G., Reading, Pa.
Warsaw Elevator Co., Baltimore, Md.
Westbrook Elevator Co., Danville, Va.
- Elevators.** (Automatic.)
Mathews Gravity Carrier Co., Ellwood City, Pa.
- Elevators.** (Portable for Warehouses, etc.)
Economy Elevator Co., Chicago, Ill.
- Elevator Bolts.**
Upon Nut Co., The, Cleveland, O.
- Elevator Buckets.**
Caldwell & Son Co., H. W., Chicago, Ill.
Hendrick Mfg. Co., Chicago, Ill.
Jeffrey Mfg. Co., Columbus, O.
Link-Belt Co., Nicetown (Philadelphia), Pa.
- Elevator Enclosures and Cabs.**
Bolles Iron & Wire Works, J. E., Detroit, Mich.
Cincinnati Mfg. Co., Cincinnati, O.
Dow Wire & Iron Works, Louisville, Ky.
Dufur & Co., Baltimore, Md.
Dufur, Bagcot & Co., Baltimore, Md.
Myers Mfg. Co., The Fred J., Hamilton, O.
Ohio Elevator & Machine Co., Columbus, O.
Otis Elevator Co., New York, N. Y.
- Elevator Ropes.** [See Wire Ropes.]
- Elevator Safety Gates.**
American Elec. Mch. & Elevator Co., St. Louis, Mo.
Richmond Safety Gate Co., Richmond, Ind.
- Emery Wheels.** [See Grinding Wheels.]
- Employment Bureau.**
Diamond Labor Agency, Chicago, Ill.
- Engineers.**
APPRAISAL.
Day & Zimmerman, Philadelphia, Pa.
Ferree Co., The H. G., Memphis, Tenn.
Houston-Kingsley Co., Memphis, Tenn.
Maxcy, John Wharton, Houston, Tex.
- BLAST FURNACES.
Smythe Co., The S. R., Pittsburgh, Pa.
- CHEMICAL.
Crosby, Walter W., Baltimore, Md.
Institute of Industrial Research, Washington, D. C.
Pittsburgh Testing Laboratory, Pittsburgh, Pa.
- CIVIL.
Arnold Co., The, Chicago, Ill.
Blair & Drane, Charlotte, N. C.
Brown & Clarkson, Washington, D. C.
Bryant, Glaucaus A., Wilson, N. C.
Firth, Joseph, Charlotte, N. C.
Freeman, Jr., Arthur C., Norfolk, Va.
Knowles, Morris, Pittsburgh, Pa.
Maynard-Carter, Chattanooga, Tenn.
Mole, H. E., New York, N. Y.
Potter, Alexander, New York, N. Y.
Rucker, B. Parks, Chattanooga, Tenn.
Shand Engineering Co., Columbia, S. C.
Solomon-Norcross Co., Atlanta, Ga.
Stevens, Harry, Washington, D. C.
Waldo, W., Houston, Tex.
Walker Engineering Corp., Tampa, Fla.
White Companies, J. G., New York, N. Y.
- DAMS.
Boyd, Geo. R., Savannah, Ga.
Quick, Alfred M., Baltimore, Md.
Requarth Co., C. W., Charlotte, N. C.
Spiker, William C., Atlanta, Ga.
White Companies, J. G., New York, N. Y.
- DRAINAGE AND IRRIGATION.
Boyd, Geo. R., Savannah, Ga.
Brown & Clarkson, Washington, D. C.
Bryant, Glaucaus A., Wilson, N. C.
Cory-Harrison & Co., San Antonio, Tex.
Cummings, F. N. (Taylor), Claremont, Va.
Dabney Engineering Co., Memphis, Tenn.
Ford, Bacon & Davis, New York, N. Y.
Knowles, Morris, Pittsburgh, Pa.
McCordy Bros. & Cheves, Inc., Charleston, S. C.
Perkins, Edmund T., Engineering Co., Chicago, Ill.
Walker Engineering Corp., Tampa, Fla.
Wright Engineering Co., San Antonio, Tex.
- EFFICIENCY.
Crosby, Walter W., Baltimore, Md.
Institute of Industrial Research, Washington, D. C.
Quick, Alfred M., Baltimore, Md.
- ELECTRICAL.
Arnold Co., The, Chicago, Ill.
Crocker-Wheeler Co., Amper, N. J.
Keilbolts, F. O., Baltimore, Md.
Levy-Morton Co., Columbus, Ga.
Lide, Martin J., Birmingham, Ala.
Mole, H. E., New York, N. Y.
Rucker, B. Parks, Charlotte, N. C.
Stone & Webster Engr. Corp., Boston, Mass.
Tucker & Laxon, Charlotte, N. C.
White, Gilbert C., Charlotte, N. C.
- ELECTRIC LIGHTS AND POWER PLANTS.
Dabney Engineering Co., Memphis, Tenn.
Ford, Bacon & Davis, New York, N. Y.
Fuller-Coutt Co., St. Louis, Mo.
Graves Engineering Co., Inc., New York, N. Y.
Gronk Engineering Co., Irwin, D., Chicago, Ill.
Houston-Kingsley Co., Memphis, Tenn.
Keilbolts, F. O., Baltimore, Md.
Levy-Morton Co., Columbus, Ga.
Scotfield Engineering Co., Philadelphia, Pa.
Stone & Webster Engr. Corp., Boston, Mass.
White Companies, J. G., New York, N. Y.
White, Gilbert C., Charlotte, N. C.
Wright Engineering Co., San Antonio, Tex.
- GAS.
Ford, Bacon & Davis, New York, N. Y.
- GARBAGE DISPOSAL.
Baylis, John R., Birmingham, Ala.
- GEOLOGICAL.
Brown & Clarkson, Washington, D. C.
Crosby, Walter W., Baltimore, Md.
Frothingham & Robertson, Richmond, Va.
Grimley, G. P., Martinsburg, W. Va.
Institute of Industrial Research, Washington, D. C.
Maynard-Carter, Chattanooga, Tenn.
- HYDRO-ELECTRIC.
Baylis, John R., Birmingham, Ala.
Brown & Clarkson, Washington, D. C.
Fuller-Coutt Co., St. Louis, Mo.
Howe, Charles F., Macon, Ga.
Knowles, Morris, Pittsburgh, Pa.
Maxcy, John Wharton, Houston, Tex.
Quick, Alfred M., Baltimore, Md.
Requarth Co., C. W., Charlotte, N. C.
Rucker, B. Parks, Charlotte, N. C.
Scotfield Engineering Co., Philadelphia, Pa.
Sims, J. E., Greenville, S. C.
Solomon-Norcross Co., Atlanta, Ga.
Spiker, William C., Atlanta, Ga.
Tucker & Laxon, Charlotte, N. C.
White Companies, J. G., New York, N. Y.
- ICE AND REFRIGERATING.
Wright Engineering Co., San Antonio, Tex.
- INDUSTRIAL PLANT.
Day & Zimmerman, Philadelphia, Pa.
Ferree Co., The H. G., Memphis, Tenn.
Gilman, Harry L., Boston, Mass.
Guarantee Construction Co., New York, N. Y.
Institute of Industrial Research, Washington, D. C.
Kent, Robert S., Brooklyn, N. Y.
Rucker, B. Parks, Charlotte, N. C.
Scotfield Engineering Co., Philadelphia, Pa.
Shearer, C. E., Memphis, Tenn.
Steinmetz, C. M., Washington, D. C.
Stone & Webster Engr. Corp., Boston, Mass.
Stevens, Harry, Washington, D. C.
Summers & Co., L. L., Chicago, Ill.
White Companies, J. G., New York, N. Y.
- INSPECTIONS AND TESTS.
Blair & Drane, Charlotte, N. C.
Crosby, Walter W., Baltimore, Md.
Frothingham & Robertson, Richmond, Va.
Hill, Nicholas S., Jr., New York, N. Y.
Hunt & Co., Robert W., Chicago, Ill.
Institute of Industrial Research, Washington, D. C.
Pittsburgh Testing Laboratory, Pittsburgh, Pa.
- LANDSCAPE.
Berckmans Co., P. J., Augusta, Ga.
Blair & Drane, Charlotte, N. C.
Crosby, Walter W., Baltimore, Md.
Cummings, F. N. (Taylor), Claremont, Va.
- LIGHTING.
Ford, Bacon & Davis, New York, N. Y.
Fuller-Coutt Co., St. Louis, Mo.
McCordy & Co., J. B., Atlanta, Ga.
Rucker, B. Parks, Charlotte, N. C.
- LUMBER PLANTS.
Steinmetz, C. M., Washington, D. C.

Engineers.

MECHANICAL.
Arnold Co., The, Chicago, Ill.
Crosch, Irvin D., Brooklyn, N. Y.
Eent Robert S., Brooklyn, N. Y.
Lide, Martin J., Birmingham, Ala.
Steinmetz, C. M., Washington, D. C.
Stevens, Harry, Washington, D. C.
Tucker & Laxton, Charlotte, N. C.

MINING.

Brown & Clarkson, Washington, D. C.
Grimsley, G. P., Martinsburg, W. Va.
Hanes, Marshall, Bridgewater, Va.
Jones, E. M., Chattanooga, Tenn.
Maynard-Carter, Chattanooga, Tenn.

MUNICIPAL.

Anderson & Christie, Charlotte, N. C.
Blair & Drane, Charlotte, N. C.
Brown & Clarkson, Washington, D. C.
Crosby, Walter W., Baltimore, Md.
Cory-Harrison & Co., San Antonio, Texas.
Dabney Engineering Co., Memphis, Tenn.
Elrod, Henry E., Dallas, Texas.
Firth, Joseph, Charlotte, N. C.
Freeman, Jr., Arthur C., Norfolk, Va.
Graves Engineering Co., Inc., New York, N. Y.
Knowles, Morris, Pittsburgh, Pa.
McCarty Bros. & Cheves, Inc., Charleston, S. C.
McCrady Co., J. B., Atlanta, Ga.
Pew, Arthur, Atlanta, Ga.
Shand Engineering Co., Columbia, S. C.
Shaw, F. H., Lancaster, Pa.
Walker Engineering Corp., Tampa, Fla.
White, Gilbert C., Charlotte, N. C.

PAVING AND ROAD.

Anderson & Christie, Charlotte, N. C.
Blair & Drane, Charlotte, N. C.
Bryant, Glaucaus A., Wilson, N. C.
Crosby, Walter W., Baltimore, Md.
Elrod, Henry E., Dallas, Texas.
Firth, Joseph, Charlotte, N. C.
Fuller-Coutt Co., St. Louis, Mo.
Institute of Industrial Research, Washington, D. C.
McCarty Bros. & Cheves, Inc., Charleston, S. C.
Shand Engineering Co., Columbia, S. C.
White, Gilbert C., Charlotte, N. C.

PUBLIC SERVICE PROPERTIES.

Dey & Zimmerman, Philadelphia, Pa.
Ferree Co., The, H. G., Memphis, Tenn.
Ford, Bacon & Davis, New York, N. Y.
Gilman, Harry L., Boston, Mass.
Graves Engineering Co., Inc., New York, N. Y.
Maxcy, John Wharton, Houston, Tex.
Scotfield Engineering Co., Philadelphia, Pa.
Stone & Webster Engr. Corp., Boston, Mass.
White Companies, J. G., New York, N. Y.

REINFORCED CONCRETE. (Bridges, Buildings, etc.)
Caldwell-Wingate Co., Atlanta, Ga.
Cummings, F. N., Taylor, Ga.
Foster-Creighton-Gould Co., Nashville, Tenn.
Guarantee Construction Co., New York, N. Y.
Luten, Daniel B., Indianapolis, Ind.
Potter, Alexander, New York, N. Y.
Requarth Co., O. W., Charlotte, N. C.
Savannah Eng. & Construction Co., Savannah, Ga.
Spiker, William C., Atlanta, Ga.
Steinmetz, C. M., Washington, D. C.
Tucker & Laxton, Charlotte, N. C.
White Companies, J. G., New York, N. Y.

RIVER AND HARBOR.

Gilman, Harry L., Boston, Mass.

SEWERAGE AND WATER-WORKS.

Anderson & Christie, Charlotte, N. C.
Baylis, John R., Birmingham, Ala.
Blair & Drane, Charlotte, N. C.
Brown & Clarkson, Washington, D. C.
Bryant, Glaucaus A., Wilson, N. C.
Cory-Harrison & Co., San Antonio, Texas.
Dabney Engineering Co., Memphis, Tenn.
Firth, Joseph, Charlotte, N. C.
Ford, Bacon & Davis, New York, N. Y.
Freeman, Jr., Arthur C., Norfolk, Va.
Graves Engineering Co., Inc., New York, N. Y.
Hill, Jr., Nicholas S., New York, N. Y.
Huston-Kingley Co., Memphis, Tenn.
Knowles, Morris, Pittsburgh, Pa.
Maxcy, John Wharton, Houston, Tex.
Mayer, J. H., Birmingham, Ala.
Miller, Hiram Allen, Boston, Mass.
Myers, E. W., Greensboro, N. C.
Pew, Arthur, Atlanta, Ga.
Potter, Alexander, New York, N. Y.
Quick, Alfred M., Baltimore, Md.
Shaw, F. H., Lancaster, Pa.
Stevens, Harry, Washington, D. C.
Walker Engineering Corp., Tampa, Fla.
Washburn Co., A. H., Charlotte, N. C.
White Companies, J. G., New York, N. Y.
White Gilbert C., Charlotte, N. C.
Wright Engineering Co., San Antonio, Tex.

STEEL WORK AND ROLLING MILLS.
Smythe Co., The, S. R., Pittsburgh, Pa.

STRUCTURAL STEEL.

Foster-Creighton-Gould Co., Nashville, Tenn.
Freeman, Jr., Arthur C., Norfolk, Va.
Shearer, O. E., Memphis, Tenn.
Solomon-Norcross Co., Atlanta, Ga.
Spiker, William C., Atlanta, Ga.

THEATRE CONSTRUCTION.

Gatlin, W. R., Hopkinsville, Ky.

Engines.

COMPRESSED AIR.
Dake Engine Co., Grand Haven, Mich.

GAS AND GASOLINE.

Allis-Chalmers Manufacturing Co., Milwaukee, Wis.
Cooper Co., C. & G., Mt. Vernon, Ohio.
Gibbs Machinery Co., Inc., Columbus, S. O.
Heer Engine Co., Portsmouth, O.
Mietz, A., New York, N. Y.
Otto Gas Engine Works, Philadelphia, Pa.
Southern Engine & Boiler Works, Jackson, Tenn.
Struthers-Wells Co., Warren, Pa.
Van Duzen, Roy, Co., The, Columbus, O.
Westinghouse Machine Co., The, Pittsburgh, Pa.

OIL.

Hollenders Co., The, New York, N. Y.
Fairbanks-Morse & Co., Buffalo, N. Y.
Heer Engine Co., Portsmouth, Ohio.
Mietz, A., New York, N. Y.
Snow Steam Pump Works, The, New York, N. Y.

STEAM.

Allis-Chalmers Manufacturing Co., Milwaukee, Wis.
American Hoist & Derrick Co., St. Paul, Minn.
Ball Engine Co., Erie, Pa.
Buffalo Forge Co., Buffalo, N. Y.
Cameron & Barkley Co., Charleston, S. C.
Cooper Co., C. & G., Mt. Vernon, Ohio.
Dake Engine Co., Grand Haven, Mich.
Engberg Electric & Mechanical Works, St. Joseph, Mich.

Erie City Iron Works, Erie, Pa.
Gibbs Machinery Co., Inc., Columbus, S. O.
Griffith & Wedge Co., The, Zanesville, O.
Griscorn-Russell Co., New York, N. Y.
Harris Bros. Co., Chicago, Ill.
Houston, Stanwood & Gamble Co., Cincinnati, O.
Lefell & Co., James, Springfield, O.
Lombard Iron Works, Augusta, Ga.
Mecklenburg Iron Works, Charlotte, N. C.
Murray Iron Works Co., Burlington, Ia.
Phoenix Iron Works Co., Meadville, Pa.
Schotfield Iron Works, Macon, Ga.
Sturtevant Co., B. F., Hyde Park, Boston, Mass.
Vilter Mfg. Co., Milwaukee, Wis.
Westinghouse Machine Co., Pittsburgh, Pa.

Envelopes.

Young & Selden Co., Baltimore, Md.

Excavating Machinery.

American Clay Machinery Co., The, Bucyrus, Ohio.
American Locomotive Co., New York, N. Y.
Byers Mach. Co., The, John F., Ravenna, O.
Fairbanks Steam Shovel Co., Marion, O.
Gade Excavating Co., The, Iowa Falls, Iowa.
Hayward Co., New York, N. Y.
Jeffrey Mfg. Co., Columbus, O.
Lidgerwood Mfg. Co., New York, N. Y.
Marion-Osgood Co., Marion, O.
Monaghan Machine Co., Chicago, Ill.
Morris Machine Works, Baldwinville, N. Y.
National Hoisting Engine Co., Harrison, N. J.
Norblom Engineering Co., Philadelphia, Pa.
Williams Co., The, G. H., Cleveland, O.

Excavators. (Trench.)

Fairbanks Steam Shovel Co., Marion, O.
Gade Excavating Co., The, Iowa Falls, Iowa.
Hayward Co., The, New York, N. Y.
Monaghan Machine Co., Chicago, Ill.

Excelsior Machinery.

Kline, Lewis T., Alpena, Mich.

Exhaust Heads.

American Spiral Pipe Works, Chicago, Ill.

Exhibits. (Machinery Builders' Equipment and Supplies.)

Builders' Exchange, Baltimore, Md.

Expansion Joints.

Badger & Sons Co., E. B., Boston, Mass.

Expanded Metal. (See Lath.)**Explosives.**

Atlas Powder Co., Wilmington, Del.
Du Pont de Nemours Powder Co., E. I., Wilmington, Del.
Jefferson Powder Co., Birmingham, Ala.
Keystone Nat'l. Powder Co., Emporium, Pa.

Export Trade Journal.

El Comercio, New York, N. Y.

Factory Sites. (Town and Railroad.)

[See Industrial, Agricultural and Commercial Opportunities.]

Fans. (Electric.)

General Electric Co., Schenectady, N. Y.
Robbins & Myers Co., Springfield, O.

Fans. (Ventilating.)

[See Blowers, Exhaust Fans.]

Fastener Driving Machine. (Corrugated Joint.)

Saranac Machine Co., Benton Harbor, Mich.

Feed-Water Heaters and Purifiers.

American Water Softener Co., Philadelphia, Pa.
Blake & Knowles Steam Pump Works, East Cambridge, Mass.
Erie City Iron Works, Erie, Pa.
Griscorn-Russell Co., New York, N. Y.
Murray Iron Works Co., Burlington, Ia.
National Pipe Bending Co., New Haven, Conn.
Scales & Sons Co., Wm. B., Pittsburgh, Pa.
Stewart Heater Co., Buffalo, N. Y.

Feed-Water Heater and Purifier and Oil Separator Combined.

Blake & Knowles Steam Pump Works, East Cambridge, Mass.

Felt. (Building, Sheathing.)

Barrett Mfg. Co., Philadelphia, Pa.

Fencing.

Gulf States Steel Co., Birmingham, Ala.

Fencing, Entrance Gates. (Iron, Steel, Wire.)

Bolles Iron & Wire Wks., J. E., Detroit, Mich.
Dow Wire & Iron Works, Louisville, Ky.
Dufur & Co., Baltimore, Md.
New Jersey Wire Cloth Co., Trenton, N. J.
Ohio Elevator & Mach. Co., The, Columbus, O.

Fertilizer Machy. (See Also Phosphate Mch.)

Stedman's Foundry & Machine Works, Aurora, Ind.

Fibre. (Vulcanized.)

Continental Fibre Co., Newark, Del.

Files.

Barnett Co., G. & H., Philadelphia, Pa.

Filters. (Water, for Domestic and Industrial Purposes.)

American Water Softener Co., Philadelphia, Pa.
International Filter Co., Chicago, Ill.
Lynn-Superior Co., The, Cincinnati, O.
New York Con. Jewell Fil. Co., New York, N. Y.

Fire Clay. (See Brick, Fire.)**Fire Door Fixtures.**

Richmond Safety Gate Co., Richmond, Ind.

Fire Extinguishers.

Badger & Sons Co., E. B., Boston, Mass.

Fire Escapes.

Bolles Iron & Wire Works, J. E., Detroit, Mich.

Fire Places. (Brick and Tile.)

Hood Brick Co., B. Mifflin, Atlanta, Ga.

Fireproof Building Construction. (See Concrete Construction.)**Fireproof Building Material.**

Hannon Pipe Co., P., Louisville, Ky.

Fireproof Doors and Shutters.

Kinnear Mfg. Co., Columbus, O.
Richmond Safety Gate Co., Richmond, Ind.
Victor Mfg. Co., Newburyport, Mass.

Fireproof Windows. (See Window Frames and Sashes (Fireproof).)

American Steel & Wire Co., Chicago, Ill.

Fittings. (Wire Rope.)

Waterbury Co., New York, N. Y.

Fireproofing. (Brick and Tile.)

Hood Brick Co., B. Mifflin, Atlanta, Ga.

Fixtures. (Electric Lighting.)

Hill & Co., Walter E., Baltimore, Md.

Flanges. (Iron and Steel.)

American Cast Iron Pipe Co., Birmingham, Ala.
American Pipe & Construction Co., Phila., Pa.
American Spiral Pipe Works, Chicago, Ill.

Flare Lamps.

Prest-O-Lite Co., Inc., The, Indianapolis, Ind.

Flexible Joints.

Moran Flex. Steam Joint Co., Inc., Louisville, Ky.

Floor Surfacing Machine. (Auto-Ball Bearing Electric.)

Waywell Chappell & Co., Chicago, Ill.

Floor Tile.

Northcross Mantel Co., W. J., Memphis, Tenn.

Flooring. (Crescoted Block.)

Republic Crescoting Co., Indianapolis, Ind.

Flooring. (Hardwood, Maple, Oak.)

Nashville Hardwood Flooring Co., Nashville, Tenn.
Whiting, William S., Asheville, N. C.

Flour and Grist Mill Machinery and Supplies.

Caldwell & Sons Co., H. W., Chicago, Ill.
Nordyke & Marmen Co., Indianapolis, Ind.
Salem Foundry & Machine Works, Salem, Va.
Starr Co., B. F., Baltimore, Md.
Wolf Co., Chambersburg, Pa.

Flue Lining.

Southern Sewer Pipe Co., Birmingham, Ala.

Forges.

Buffalo Forge Co., Buffalo, N. Y.

Forgings.

Weimer Chain & Iron Co., Lebanon, Pa.

Foundations. (Waterproof.)

Requarth Co., C. W., Charlotte, N. C.

Foundry Equipment and Supplies.

Newport Sand Bank Co., Inc., Newport, Ky.
Paxson Co., J. W., Philadelphia, Pa.

Foundry Facings. (Talc and Soapstone.)

Georgia Talc Co., Asheville, N. C.

Foundry and Machine Shops.

Earle Gear & Machine Co., Philadelphia, Pa.
Glamorgan Pipe & Foundry Co., Lynchburg, Va.
Goldens Foundry & Machine Wks., Columbus, Ga.
Granger & Co., Louisville, Ky.
Lombard Iron Works, Augusta, Ga.
Poole Eng. & Mach. Co., Baltimore, Md.
Titus, E. E., Petersburg, Va.
Valk & Murdoch Iron Works, Charleston, S. C.

Frogs. (See Railroad Frogs and Switches.)**Fuel Economizers.**

Green Fuel Economizer Co., Mattawan, N. Y.

Fuel Oil.

Gulf Refining Co., Pittsburg, Pa.

Furnaces. (For Industrial Purposes.)

Smythe Co., The, S. R., Pittsburgh, Pa.

Fuses. (Electrical.)

Economy Fuse & Mfg. Co., Chicago, Ill.

Fuse Shells. (Renewable.)

Economy Fuse & Mfg. Co., Chicago, Ill.

Fuses, Bases and Fittings.

Johns-Manville Co., H. W., New York, N. Y.

Galvanized Steel and Iron.

American Sheet & Tin Plate Co., Pittsburgh, Pa.
La Belle Iron Works, Steubenville, O.
McCalla, Inc., Harold, Philadelphia, Pa.
Portsmouth Steel Co., Portsmouth, O.
Wood Iron & Steel Co., Alan, Philadelphia, Pa.
Youngstown Sheet & Tube Co., Youngstown, O.

Garage and House. (Portable.)

Dixie Culvert & Metal Co., Atlanta, Ga.

Gas Blowers. (Turbine.)

Terry Steam Turbine Co., Hartford, Conn.

Gas Engines. (See Engines, Gas.)**Gas Machines.**

Kemp Mfg. Co., O. M., Baltimore, Md.
Milburn Co., Alex. N., Baltimore, Md.

Gas Plants.

Power & Mining Machinery Co., Cudahy, Wis.

Gas Producers.

Otto Gas Engine Works, Philadelphia, Pa.
Smythe Co., The, S. R., Pittsburgh, Pa.
Westinghouse Machine Co., Pittsburgh, Pa.
Wood & Co., E. D., Philadelphia, Pa.

Gasoline and Kerosene.

Gulf Refining Co., Pittsburg, Pa.

Gas and Steam Fitters' Tools.

Saunders' Sons, D., Yonkers, N. Y.

Gears.

American Die & Tool Co., Reading, Pa.
Caldwell & Sons Co., H. W., Chicago, Ill.
Crescon-Morris Co., Philadelphia, Pa.
Earle Gear & Machine Co., Philadelphia, Pa.
James Mfg. Co., D. O., Chicago, Ill.
Jeffrey Mfg. Co., Columbus, O.
Poole Engineering & Machine Co., Baltimore, Md.

Generators. (Hot Water.)

Griscorn-Russell Co., New York, N. Y.

Generating Sets.

Engberg Electric & Mechanical Works, St. Joseph, Mich.
Sturtevant Co., B. F., Hyde Park, Boston, Mass.

Geologists.

Davis, Geo. C., Phila., Pa.

Froehling & Robertson, Richmond, Va.

Grimsley, G. P., Martinsburg, W. Va.

Maynard-Carter, Chattanooga, Tenn.

Glass. (Plate, etc.)

Binswanger & Co., Memphis, Tenn.

Governors. (Steam Engine.)

Pickering Governor Co., Portland, Conn.

Grain Elevator Supplies.

Caldwell & Sons Co., H. W., Chicago, Ill.
Jeffrey Mfg. Co., Columbus, O.
Link-Belt Co., Nictown (Philadelphia), Pa.

Granite.

Byrd Bros., Salisbury, N. C.

Graphite.

Dixon Crucible Co., Joseph, Jersey City, N. J.

Grates and Grate Bars.

Huber Grate Bar & Stoking Co., Baltimore, Md.

Gravel.

Arundel Sand & Gravel Co., Baltimore, Md.

Gravel. (Roofing and Road)

American Ballast Co., Knoxville, Tenn.

Gravity Spiral Chutes.

Mathews Gravity Carrier Co., Ellwood City, Pa.

Grease.

Albany Lubricating Co., New York, N. Y.

Grease Cups.

Albany Lubricating Co., New York, N. Y.

Greases and Lubricating Compounds.

Albany Lubricating Co., New York, N. Y.

Galena Signal Oil Co., Franklin, Pa.

Robinson & Son Co., Wm. C., Baltimore, Md.

Grinders. (Gypsum, Limestone, etc.)

Stedman's Foundry & Machine Wks., Aurora, Ind.

Grinding Wheels.

Carborundum Co., Niagara Falls, N. Y.
Vitrified Wheel Co., Westfield, Mass.

Groovers.

Huther Bros. Saw Mfg. Co., Inc., Rochester, N. Y.

Gunpowder.

Atlas Powder Co., Wilmington, Del.
Du Pont de Nemours Powder Co., E. I., Wilmington, Del.
Jefferson Powder Co., Birmingham, Ala.
Keystone National Powder Co., Emporium, Pa.

Hammers. (Steam, Power, Pneumatic.)

Independent Pneumatic Tool Co., Chicago, Ill.

Handle Machinery. (See Woodworking Mch.)**Hangers. (See Pulleys, Shafting and Hangers.)****Hay Tools.**

Myers & Bro., F. E., Ashland, .

Heater. (Asphalt.)

Cummer & Son Co., F. D., The, Cleveland, Ohio.

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Industrial Track Work. [See Railways, Ind.]**Injectors.**

Jenkins Bros., New York, N. Y.
Lunkenheimer Co., The, Cincinnati, O.
Sellers & Co., Inc., Wm., Philadelphia, Pa.

Insulated Wires and Cables.

American Steel & Wire Co., Chicago, Ill.
Safety Insulated Wire & Cable Co., New York, N. Y.

Insulating Materials.

Continental Fibre Co., Newark, Del.
General Electric Co., Schenectady, N. Y.
John-Manville Co., H. W., New York, N. Y.
Standard Paint Co., New York, N. Y.

Insulating (Tape).

Standard Paint Co., New York, N. Y.

Insulating (Varnishes and Compounds).

Standard Paint Co., New York, N. Y.

Iron.

La Belle Iron Works, Steubenville, O.
Lebanon Valley Iron & Steel Co., Lebanon, Pa.
Milton Mfg. Co., M. Iton, Pa.
Republic Iron & Steel Co., Youngstown, O.
Tennessee Coal, Iron & R. R. Co., Birmingham, Ala.
Union Drawn Steel Co., Beaver Falls, Pa.
Wood Iron & Steel Co., Alan, Philadelphia, Pa.

Irrigation Machinery.

Cameron Steam Pump Wks., A. S. New York, N. Y.

Investment Securities.

Provident Savings Bank & Trust Co., Cincinnati, Ohio.

Jobbers. (Electrical.)

Carroll Electrical Co., Washington, D. C.

Junk Dealers.

Kander & Co., H., Bowling Green, Ohio.

Kettles. (Steam Jacket.)

Badger & Sons Co., E. H., Boston, Mass.

Key Seater. (Portable.)

Burr & Son, John T., Brooklyn, N. Y.

Knitting Machinery.

Acme Knitting Mch. & Needle Co., Franklin, N. H.

Labor Agency.

Diamond Labor Agency, Chicago, Ill.

Lace Leather.

Graton & Knight Mfg. Co., Worcester, Mass.

Lamps. (Arc and Incandescent.)

Boston-Economy Lamp Division, Danvers, Mass.
General Electric Co., Schenectady, N. Y.
Lee Electric Co., Baltimore, Md.
Piedmont Electric Co., Asheville, N. C.
Westinghouse Lamp Co., New York, N. Y.

Lamps. (Carbon and Tungsten.)

Sewman Electric Lamp Co., Cincinnati, O.

Lamp Posts. (Electric Gas.)

Union Foundry Co., Anniston, Ala.
Western Gas Construction Co., Ft. Wayne, Ind.

Lamp Standards. (Ornamental Iron.)

Union Foundry Co., Anniston, Ala.

Lands. (Mineral, Timber, Farm, etc.) [See Industrial, Agricultural and Commercial Opportunities.]**Landscape Architects (See Engineers.) [Landscape]****Lath. (Expanded Metal.)**

Aronson Co., L. Columbia, S. C.
Milwaukee Artistic Metal Ceiling Co., Milwaukee, Wis.

Lathes. (Engine.)

Greaves, Klusman Tool Co., The, Cincinnati, O.

Latin American Trade.

El Comercio, New York, N. Y.

Lawn Furniture. (Wire.)

Bolles Iron & Wire Works, J. E., Detroit, Mich.
Dufur & Co., Baltimore, Md.
Dufur, Baggett & Co., Baltimore, Md.

Leadite.

Leadite Co., Inc., The, Philadelphia, Pa.

Light Plants.

Carlisle & Finch Co., The, Cincinnati, Ohio.

Lights. (Portable Acetylene.)

Milburn Co., Alex. N., Baltimore, Md.

Lime. (Hydrated.)

Kentucky Portland Cement & Coal Co., Louisville, Ky.

Limestone Products.

Kentucky Portland Cement & Coal Co., Louisville, Ky.

Liquor Filters.

International Filter Co., Chicago, Ill.

Lithographers, Engravers.

Young & Seiden Co., Baltimore, Md.

Lockers. (Metal.)

Bernstein Mfg. Co., Phila., Pa.
Kelley Metal Ceiling Mfg. Co., S., Pittsburgh, Pa.

Lockers (Steel)

Merritt & Co., Camden, N. J.

Locomotives.

INDUSTRIAL.
American Locomotive Co., New York, N. Y.
Baldwin Locomotive Wks., The, Philadelphia, Pa.
Olinax Mfg. Co., Corry, Pa.
Oard, Geo. B., Cincinnati, O.
Davenport Locomotive Works, Davenport, Ia.
Jeffrey Mfg. Co., Columbus, O.
Lima Locomotive Corporation, Lima, O.
Porter Co., H. K., Pittsburgh, Pa.
Southern Iron & Equipment Co., Atlanta, Ga.

RAILWAY.

American Locomotive Co., New York, N. Y.
Baldwin Locomotive Wks., The, Philadelphia, Pa.
Lima Locomotive Corporation, Lima, O.
Porter Co., H. K., Pittsburgh, Pa.

Log Dumping Device.

Chase Turbine Mfg. Co., Orange, Mass.

Looms and Weaving Machinery.

Draper Co., Hopedale, Mass.

Mason Machine Works.

Mason Machine Works, Taunton, Mass.

Saco-Lowell Shops.

Saco-Lowell Shops, Boston, Mass.

Loom Harness.

American Supply Co., Providence, R. I.

Lubricants.

Albany Lubricating Co., New York, N. Y.

Oils Elevator Co., New York, N. Y.

Otis Elevator Co., New York, N. Y.

Lubricants. (Graphite.)

Dixon Crucible Co., Joseph, Jersey City, N. J.

Lumber.

Industrial Lumber Co., Elizabeth, La.

Lumber. (Creosote.)

American Creosote Works, New Orleans, La.

Lumber. (Heavy Construction, Pitch Pine, etc.)

Industrial Lumber Co., Elizabeth, La.
National Lumber & Creosote Co., Texarkana, Ark.

Lumber Buggies.

Soule Steam Feed Works - Meridian, Miss.

Lumber Stackers.

Soule Steam Feed Works, Meridian, Miss.

Machinery. (Special.)

Bliss Co., E. W., Brooklyn, N. Y.
Kline, Lewis T., Alpena, Mich.
Universal Machine Co., Baltimore, Md.

Machinery and Supplies. (New and Second-Hand Bargains.)

Assets Purchasing Co., Wheeling, W. Va.

Boston Iron & Metal Co., Balto., Md.

Casey Machinery Co., D. L., Springfield, O.

Cleveland Belting & Machinery Co., Cleveland, O.

Consolidated Iron & Metal Co., Chattanooga, Tenn.

Contractors' Service Co., New York, N. Y.

Duzets & Son, New York, N. Y.

Harris Bros. Co., Chicago, Ill.

Hittner's Sons Co., Henry A., Philadelphia, Pa.

Hyde Bros. Steel & Rail Co., Pittsburgh, Pa.

Lehman, Charles T., Birmingham, Ala.

Lodge & Shipley Mach. Tool Co., Cincinnati, O.

Marine Metal & Supply Co., New York, N. Y.

Moore & Co., Edgar M., Pittsburgh, Pa.

Nussbaum & Co., V. M., Fort Wayne, Ind.

Pannueller Engineering Co., Chicago, Ill.

Pipe & Contractors' Supply Co., New York, N. Y.

Power Equipment Co., New York, N. Y.

Prentiss Tool & Supply Co., New York, N. Y.

Randall Machinery Co., Cincinnati, O.

Read Co., Howard W., Philadelphia, Pa.

Sachsenmayer & Co., George, Philadelphia, Pa.

Samuel, Frank, Philadelphia, Pa.

Seyfert's Sons, Inc., L. F., Philadelphia, Pa.

South Side Fdry. & Mch. Co., Charleston, W. Va.

Southern Mch. & Equipment Co., Lynchburg, Va.

Tampa Machinery Exchange, Tampa, Fla.

Texas Supply Co., Beaumont, Tex.

Thomasville Iron Works, Thomasville, Ga.

Tommer, Frank, Inc., Philadelphia, Pa.

Wilson Machy. Co., Harold, R., St. Louis, Mo.

Winterer Co., Herman L., Philadelphia, Pa.

Machine Tools.

Greaves, Klusman Tool Co., The, Cincinnati, O.

Machinists. (Engineers.)

Savannah Iron Works, Savannah, Ga.

Universal Machine Co., Baltimore, Md.

Magnesia Materials.

John-Manville Co., H. W., New York, N. Y.

Magnetic Separators.

Buchanan & Co., Inc. C. G., New York, N. Y.

Faxon Co., J. W., Philadelphia, Pa.

Mail Chutes.

Cutler Mail Chute Co., Rochester, N. Y.

Mantels. (Tile.)

Northcross Mantel Co., W. J., Memphis, Tenn.

Mantels. (Wooden.)

Northcross Mantel Co., W. J., Memphis, Tenn.

Mechanical Draft.

Buffalo Forge Co., Buffalo, N. Y.

Sturtevant Co., B. F., Hyde Park, Boston, Mass.

Metal Ceilings. [See Ceilings, Metal.]**Metaline.**

Metaline Co., Long Island City, N. Y.

Metal. (For Tanks, Culverts, Roofing, etc.)

Portsmouth Steel Co., Portsmouth, O.

Metal Corner Bead.

Penn Metal Co., Boston, Mass.

Metal Culverts. [See Culverts.] (Corrugated Metal.)**Metal Shingles. [See Shingles.] (Metal.)****Metal Stamping.**

Niagara Falls Metal Stamping Works, Niagara Falls, N. Y.

Metal Window Frames and Sash. [See Window Frames and Sash.] (Fireproof.)**Metal Work. [See Sheet Metal Work.]****Metal-Working Machinery. (Sheet.)**

Bliss Co., E. W., Brooklyn, N. Y.

Meters. (Water.)

Alberger Pump & Condenser Co., New York, N. Y.

Meter Boxes, Couplings, Gauges. (Water.)

Clark Co., H. W., Mattoon, Ill.

Micrometers, Calipers, etc.

Starrett Co., L. S., Athol, Mass.

Milk Filters. (Liquor, Milk, etc.)

International Filter Co., Chicago, Ill.

Mill Engineers and Architects.

O'Brian, W. C., Memphis, Tenn.

Sirrine, J. E., Greenville, S. C.

Mill Supplies.

Bailey-Lobby Co., Charleston, S. C.

Cameron & Barkley Co., Charleston, S. C.

Gainesville Iron Works, Gainesville, Ga.

Lombard Iron Works, Augusta, Ga.

Lunkenheimer Co., The, Cincinnati, O.

Mecklenburg Iron Works, Charlotte, N. C.

Nordyke & Marrison Co., Indianapolis, Ind.

Salem Foundry & Machine Wks., Salem, Va.

Starr Co., R. F., Baltimore, Md.

Wolf Co., Chambersburg, Pa.

Mining Machinery. (Gold, Copper, Plata, etc.)

Bartlett & Snow Co., C. O., Cleveland, O.

Jeffrey Mfg. Co., Columbus, O.

McLannan-Stone Mach. Co., Hollidaysburg, Pa.

Mecklenburg Iron Works, Charlotte, N. C.

Raymond Bros. Impact Pulv. Co., Chicago, Ill.

Mixers. (Concrete.)

Atlas Engineering Co., Milwaukee, Wis.

Andon Machinery Co., W. E., Atlanta, Ga.

Blystone Mfg. Co., Cambridge Springs, Pa.

Standard Scale & Supply Co., Pittsburgh, Pa.

Van Duzens, R. O., The, Columbus, O.

Mixing Machinery.

Dunning, W. D., Syracuse, N. Y.

Lynn-Superior Co., The, Cincinnati, O.

Mortar Colors.

Chattanooga Paint Co., Chattanooga, Tenn.

Motor Trucks. (Electric.)

General Vehicle Co., Long Island City, N. Y.

Motor Trucks. (Gasoline.)

White Co., The, Cleveland, O.

Motor Trucks. (Second Hand.)

Mar-Del Mobile Co., Baltimore, Md.

Music Wire.

Waterbury Co., The, New York, N. Y.

Nails. (Cut.)

La Belle Iron Works, Steubenville, O.

Nails and Spikes.

La Belle Iron Works, Steubenville, Ohio.
Lebanon Valley Iron & Steel Co., Lebanon, Pa.
Republic Iron & Steel Co., Youngstown, O.
Youngstown Sheet & Tube Co., Youngstown, O.

Nuts. [See Bolts, Nuts, Rivets, etc.]**Office Furniture (Steel)**

Merritt & Co., Camden, N. J.

Oil. (Creosote.)

Barrett Mfg. Co., Philadelphia, Pa.

Oils. (Lubricating, Etc.)

Albany Lubricating Co., New York, N. Y.

Galena Signal Oil Co., Franklin, Pa.

Gulf Refining Co., Pittsburgh, Pa.

Robinson & Son Co., Wm. C., Baltimore, Md.

Oil Cans.

Wall Mfg. Supply Co., P., Allegheny, Pa.

Oil Engines. [See Engines (Oil).]**Oil Separators.**

Stewart Heater Co., Buffalo, N. Y.

Oil Well Machinery.

Keystone Steam Well Mach. Co., Beaver Falls, Pa.

Williams Bros., Ithaca, N. Y.

Oil Well Tubing and Casing.

Ryers Co., A. M., Pittsburgh, Pa.

Ore Handling Machinery. [See Coal Handling Machinery.]**Ornamental Iron Works.**

Bolles Iron & Wire Wks., J. E., Detroit, Mich.

Chesapeake Iron Works, Baltimore, Md.

Cincinnati Mfg. Co., Cincinnati, O.

Dow Wire & Iron Works, Louisville, Ky.

Oiler Elevator & Mach. Co., The, Columbus, O.

Schrieber & Sons Co., The, Cincinnati, O.

Sneed Architectural Iron Works, Louisville, Ky.

Ovens. (Baking, Enameling, Japanning.)

Oven Equipment & Mfg. Co., The, New Haven, Conn.

Oxygen.

International Oxygen Co., New York, N. Y.

Oxygen Generators.

International Oxygen Co., New York, N. Y.

Oxy-Acetylene Welding and Cutting Outfit and Supplies.

International Oxygen Co., New York, N. Y.

Milburn Co., Alex. N., Baltimore, Md.

Packing. (Asbestos, Metallic, Rubber, Leather, etc.)

Goodyear Tire & Rubber Co., Akron, Ohio.

CLASSIFIED INDEX OF ADVERTISEMENTS.

- Pulleys. (Friction Clutch.)**
Caldwell & Son Co., H. W., Chicago, Ill.
Crescon-Morris Co., Philadelphia, Pa.
Medart Patent Pulley Co., St. Louis, Mo.
Moore & White Co., The, Philadelphia, Pa.
Poole Engineering & Mach. Co., Baltimore, Md.
Wood's Sons Co., T. B., Chambersburg, Pa.
- Pulleys. (Steel Rim.)**
Medart Patent Pulley Co., St. Louis, Mo.
- Pulleys. (Wood Split.)**
Caldwell & Son Co., H. W., Chicago, Ill.
Lane Mfg. Co., Montpelier, Vt.
Medart Patent Pulley Co., St. Louis, Mo.
Reeves Pulley Co., Columbus, Ind.
Saginaw Mfg. Co., Saginaw, Mich.
Salem Foundry & Machine Wks., Salem, Va.
- Pulleys, Shafting and Hangers.**
Caldwell & Son Co., H. W., Chicago, Ill.
Crescon-Morris Co., Philadelphia, Pa.
Dodge Manufacturing Co., Mishawaka, Ind.
Golden's Foundry & Mach. Co., Columbus, Ga.
Jeffrey Mfg. Co., Columbus, O.
Jones & Laughlin Steel Co., Pittsburgh, Pa.
Lane Mfg. Co., Montpelier, Vt.
Link-Belt Co., Nictown (Philadelphia), Pa.
Medart Patent Pulley Co., St. Louis, Mo.
Nordyke & Marmon Co., Indianapolis, Ind.
Poole Engineering & Mach. Co., Baltimore, Md.
Wood's Sons Co., T. B., Chambersburg, Pa.
- Pulverizers.**
Aising Engineering Co., J. R., New York, N. Y.
Austin Mfg. Co., Chicago, Ill.
Gruender Pat. Crusher & Pulv. Co., St. Louis, Missouri.
Jeffrey Mfg. Co., Columbus, O.
McLanahan-Stone Mach. Co., Hollidaysburg, Pa.
Raymond Bros., Impact Pulv. Co., Chicago, Ill.
Stedman's Foundry & Machine Wks., Aurora, Ind.
Western Wheel Scraper Co., Aurora, Ill.
- Pumping Machinery.**
Alberger Pump & Condenser Co., New York, N. Y.
Cameron Steam Pump Wks., A. S., New York, N. Y.
Cook Well Co., The, St. Louis, Mo.
Dean Bros. Steam Pump Wks., Indianapolis, Ind.
Deane Steam Pump Co., Holyoke, Mass.
Erie Pump & Engine Works, Erie, Pa.
Goulds Mfg. Co., Seneca Falls, N. Y.
Keystone Pump & Well Engine Co., Beaver Falls, Pa.
Moffatt Machinery Mfg. Co., Charlotte, N. C.
Morris Machine Works, Baldwinville, N. Y.
Myers & Bros., F. E., Ashland, O.
Norborn Engineering Co., Philadelphia, Pa.
Sydnor Pump & Well Co., Inc., Richmond, Va.
Union Steam Pump Co., Battle Creek, Mich.
Wood & Co., R. D., Philadelphia, Pa.
Worthington, Henry R., Harrison, N. J.
- Pumps. (Air.)**
Blakeslee Mfg. Co., Du Quoin, Ill.
- Pumps. (Boiler Feed.)**
Alberger Pump & Condenser Co., New York, N. Y.
Blakeslee Mfg. Co., Du Quoin, Ill.
Cameron Steam Pump Wks., A. S., New York, N. Y.
Dean Bros. Steam Pump Wks., Indianapolis, Ind.
Jeanville Iron Works Co., Hazelton, Pa.
Moffatt Machinery Mfg. Co., Charlotte, N. C.
Murray Iron Works Co., Burlington, Ia.
Myers & Bros., F. E., Ashland, O.
Union Steam Pump Co., Battle Creek, Mich.
- Pumps. (Centrifugal.)**
Alberger Pump & Condenser Co., New York, N. Y.
Buffalo Steam Pump Co., Buffalo, N. Y.
Cameron Steam Pump Wks., A. S., New York, N. Y.
De Laval Steam Turbine Co., Trenton, N. J.
Erie Pump & Engine Works, Erie, Pa.
Jeanville Iron Works Co., Hazelton, Pa.
Morris Machine Works, Baldwinville, N. Y.
Norborn Engineering Co., Philadelphia, Pa.
Wood & Co., R. D., Philadelphia, Pa.
Worthington, Henry R., Harrison, N. J.
- Pumps. (Deep Well.)**
Cameron Steam Pump Wks., A. S., New York, N. Y.
Goulds Mfg. Co., Seneca Falls, N. Y.
Keystone Pump & Well Engine Co., Beaver Falls, Pa.
Layne & Bowler Co., Houston, Tex.
- Pumps. (Dredging.)**
Buffalo Steam Pump Works, Buffalo, N. Y.
Dean Bros. Steam Pump Wks., Indianapolis, Ind.
Erie Pump & Engine Works, Erie, Pa.
Goulds Mfg. Co., Seneca Falls, N. Y.
Morris Machine Works, Baldwinville, N. Y.
Norborn Engineering Co., Philadelphia, Pa.
Wood & Co., R. D., Philadelphia, Pa.
- Pumps. (Hydraulic.)**
Buffalo Steam Pump Co., Buffalo, N. Y.
Cameron Steam Pump Wks., A. S., New York, N. Y.
Cardwell Machine Co., Richmond, Va.
Dean Bros. Steam Pump Wks., Indianapolis, Ind.
Erie Pump & Engine Works, Erie, Pa.
French Oil Mill Mchry. Co., The, Piqua, O.
- Pumps. (Oil and Gasoline.)**
Keystone Boiler & Fdry. Co., Columbia, Pa.
- Pumps. (Steam.)**
Alberger Pump & Condenser Co., New York, N. Y.
Blake & Knowles Steam Pump Works, East Cambridge, Mass.
Blakeslee Mfg. Co., Du Quoin, Ill.
Buffalo Steam Pump Co., Buffalo, N. Y.
Cameron Steam Pump Wks., A. S., New York, N. Y.
Cameron & Barkley Co., Charleston, S. C.
Clayton Air Compressor Works, Cambridge, Mass.
Cook Well Co., The, St. Louis, Mo.
Dean Bros. Steam Pump Wks., Indianapolis, Ind.
Deane Steam Pump Co., Holyoke, Mass.
Fairbanks-Morse & Co., Atlanta, Ga.
Keystone Pump & Well Engine Co., Beaver Falls, Pa.
Murray Iron Works Co., Burlington, Ia.
Snow Steam Pump Works, The, New York, N. Y.
Sydnor Pump & Well Co., Inc., Richmond, Va.
Union Steam Pump Co., Battle Creek, Mich.
Worthington, Henry R., Harrison, N. J.
- Pumps. (Turbine Driven.)**
Sturtevant Co., B. F., Hyde Park, Boston, Mass.
- Pumps. (Vacuum.)**
Cameron Steam Pump Wks., A. S., New York, N. Y.
Dean Bros. Steam Pump Wks., Indianapolis, Ind.
Union Steam Pump Co., Battle Creek, Mich.
- Pumps. (Water-works.)**
Goulds Mfg. Co., Seneca Falls, N. Y.
- Pump Leathers.**
Graton & Knight Mfg. Co., Worcester, Mass.
- Punches and Dies.**
American Die & Tool Co., Reading, Pa.
- Punching and Shearing Machinery.**
Blies Co., E. W., Brooklyn, N. Y.
Racks (For Pattern Storage).
Merritt & Co., Camden, N. J.
- Railroads. [See Industrial, Agricultural and Commercial Opportunities.]**
- Railroad Equipment and Supplies. (New and Second-hand.)**
American Frog & Switch Co., Hamilton, O.
American Locomotive Co., New York, N. Y.
Bailey-Lebby Co., The, Charleston, S. C.
Birmingham Rail & Loco. Co., Birmingham, Ala.
Cincinnati Frog & Switch Co., Cincinnati, O.
Curd, Geo. B., Cincinnati, O.
Fairbanks-Morse & Co., Atlanta, Ga.
Foster Co., L. B., Pittsburgh, Pa.
Georgia Car & Locomotive Co., Atlanta, Ga.
- Green Equipment Co., L. A., Pittsburgh, Pa.**
Grisham, Wm. B., Philadelphia, Pa.
Hirsch Rolling Mill Co., St. Louis, Mo.
Hoffman & Co., Inc., R. C., Baltimore, Md.
Hyde, Chas., Pittsburgh, Pa.
Kilby Frog & Switch Co., Birmingham, Ala.
Macleary, J. H., Suffolk, Va.
National Steel Rail Co., St. Louis, Mo.
Newhall Eng. Co., Geo. M., Philadelphia, Pa.
Read Co., Howard W., Philadelphia, Pa.
Robinson & Orr, Pittsburgh, Pa.
Sherwood, E. C., New York, N. Y.
Southern Iron & Equipment Co., Atlanta, Ga.
Steel Rail Supply Co., The, New York, N. Y.
United States Rail Co., Cumberland, Md.
Weir Frog Co., Cincinnati, O.
Wilson Mach. Co., Harold R., St. Louis, Mo.
Zellicker Supply Co., Walter A., St. Louis, Mo.
- Railroad Frogs & Switches.**
American Frog & Switch Co., Hamilton, O.
Cincinnati Frog & Switch Co., Cincinnati, O.
Conley Frog & Switch Co., Memphis, Tenn.
Easton Car & Construction Co., Easton, Pa.
Kilby Frog & Switch Co., Birmingham, Ala.
Newhall Engineering Co., Geo. M., Philadelphia, Pa.
Robinson & Orr, Pittsburgh, Pa.
Sweet's Steel Co., Williamsport, Pa.
Weir Frog Co., Cincinnati, O.
- Rails. (Steel.)**
Carnegie Steel Co., Pittsburgh, Pa.
Continental Iron & Steel Co., New York, N. Y.
Foster Co., L. B., Pittsburgh, Pa.
Frank, J. E., Atlanta, Ga.
Green Equipment Co., L. A., Pittsburgh, Pa.
Gulf States Steel Co., Birmingham, Ala.
Hirsch Rolling Mill Co., St. Louis, Mo.
Hoffman & Co., Inc., R. C., Baltimore, Md.
Hyde Bros. Steel & Rail Co., Pittsburgh, Pa.
Hyde, Chas., Pittsburgh, Pa.
Lackawanna Steel Co., Lackawanna, N. Y.
Levis & Co., Henry, Philadelphia, Pa.
Macleary, J. H., Suffolk, Va.
National Steel Rail Co., St. Louis, Mo.
Newhall Eng. Co., Geo. M., Philadelphia, Pa.
Republ Iron & Steel Co., Youngstown, O.
Robinson & Orr, Pittsburgh, Pa.
Sherwood, E. C., New York, N. Y.
Southern Iron & Equipment Co., Atlanta, Ga.
Steel Rail Supply Co., The, New York, N. Y.
Sweet's Steel Co., Williamsport, Pa.
Tennessee Coal, Iron & R. R. Co., B'm'gh'm, Ala.
United States Rail Co., Cumberland, Md.
Wilson & Co., E. H., Philadelphia, Pa.
- Rail Bonds.**
American Steel & Wire Co., Chicago, Ill.
- Rail Braces, Crossings, etc. [See R. R. Frogs and Switches.]**
- Railings and Grilles. (Brass.)**
Newman Mfg. Co., Cincinnati, O.
- Railways. (Industrial.)**
Chase Fdry. & Mfg. Co., Columbus, O.
Cincinnati Frog & Switch Co., Cincinnati, O.
Easton Car & Construction Co., Easton, Pa.
Hunt Co., Inc., C. W., West New Brighton, N. Y.
Link-Belt Co., Nictown (Philadelphia), Pa.
- Rams. (Hydraulic.) [See Hydraulic Ram.]**
- Reamers.**
American Die & Tool Co., Reading, Pa.
Morris Twist Drill & Mch. Co., New Bedford, Mass.
- Reeds.**
American Supply Co., Providence, R. I.
- Refrigerating Machinery and Apparatus.**
Huetteman & Cramer Co., The, Detroit, Mich.
Remington Machine Co., Wilmington, Del.
Vilter Mfg. Co., Milwaukee, Wis.
York Machine Co., Henry, Louisville, Ky.
York Mfg. Co., York, Pa.
- Reinforcing Bars. [See Concrete Reinforcing Bars.]**
- Riveters. (Pneumatic.)**
Independent Pneumatic Tool Co., Chicago, Ill.
- Road Machinery.**
Austin Bros., Atlanta, Ga.
Austin-Western Road Mchry. Co., The, Chicago, Ill.
Buffalo Steam Roller Co., Buffalo, N. Y.
Contractors Mchry. & Supply Co., Pittsburgh, Pa.
Erie Machine Shops, Erie, Pa.
Galton Iron Works & Mfg. Co., The, Galton, Ohio.
Holt Manufacturing Co., The, Peoria, Ill.
Huber Mfg. Co., The, Marion, Ohio.
Kelly Springfield Road Roller Co., Springfield, O.
Universal Road Mchry. Co., Kingston, N. Y.
Western Wheel Scraper Co., Aurora, Ill.
Wheeling Mill & Fdry. Co., Wheeling, W. Va.
- Roadmaking Materials.**
Austin Bros., Atlanta, Ga.
Barber Asphalt Paving Co., Philadelphia, Pa.
Barrett Mfg. Co., Philadelphia, Pa.
Standard Oil Co., Inc., Newark, N. J.
U. S. Asphalt Refining Co., New York, N. Y.
- Road Rollers. (Steam.)**
Austin-Western Road Mchry. Co., The, Chicago, Ill.
Barber Asphalt Paving Co., The, Buffalo, N. Y.
Buffalo Steam Roller Co., Buffalo, N. Y.
Erie Machine Shops, Erie, Pa.
Huber Mfg. Co., The, Marion, Ohio.
Kelly Springfield Road Roller Co., Springfield, O.
Universal Road Mchry. Co., Kingston, N. Y.
- Road Oil.**
Gulf Refining Co., Pittsburgh, Pa.
Standard Oil Co., Inc., Newark, N. J.
U. S. Asphalt Refining Co., New York, N. Y.
- Road Preservatives.**
Barrett Mfg. Co., Philadelphia, Pa.
Fuley, Sam. E., Atlanta, Ga.
Gulf Refining Co., Pittsburgh, Pa.
Standard Oil Co., Inc., Newark, N. J.
U. S. Asphalt Refining Co., New York, N. Y.
- Road Scarifiers.**
Buffalo Steam Roller Co., Buffalo, N. Y.
Galton Iron Works & Mfg. Co., The, Galton, Ohio.
Huber Mfg. Co., The, Marion, Ohio.
- Rock Crushers. [See Crushers, Rock.]**
- Roller Covering Supplies.**
American Supply Co., Providence, R. I.
- Roofing Caps.**
Robertson Steel & Iron Co., W. F., Cincinnati, O.
- Roofing. (Ready Prepared: Felt, Tar, Asbestos, Asphalt.)**
American Sheet & Tin Plate Co., Pittsburgh, Pa.
Asbestos Protected Metal Co., Beaver Falls, Pa.
Asphalt Ready Roofing Co., New York, N. Y.
Barber Asphalt Paving Co., Philadelphia, Pa.
Barrett Mfg. Co., Philadelphia, Pa.
Cameron & Barkley Co., Charleston, S. C.
Chesapeake Roofing & Pipe Covering Co., Baltimore, Md.
Johns-Manville Co., H. W., New York, N. Y.
Standard Paint Co., The, New York, N. Y.
- Roofing. (Metal Shingles.) [See Shingles, Metal.]**
Cortright Metal Roofing Co., Philadelphia, Pa.
Edwards Mfg. Co., The, Cincinnati, O.
- Milwaukee Artistic Metal Ceiling Co., Milwaukee, Wis.**
Milwaukee Corrugating Co., Milwaukee, Wis.
- Roofing. (Slate.)**
East Bangor Consol. Slate Co., East Bangor, Pa.
Genuine Bangor Slate Co., Easton, Pa.
Johnson, E. J., New York, N. Y.
- Roofing and Siding. (Metal.)**
American Sheet & Tin Plate Co., Pittsburgh, Pa.
Asbestos Protected Metal Co., Beaver Falls, Pa.
Cameron & Barkley Co., Charleston, S. C.
Cortright Metal Roofing Co., Philadelphia, Pa.
Edwards Mfg. Co., The, Cincinnati, O.
Hydman Roofing Co., Cincinnati, O.
Milwaukee Artistic Metal Ceiling Co., Milwaukee, Wis.
- Roofs. (Wire.)**
American Steel & Wire Co., Chicago, Ill.
Broderick & Bascom Rope Co., St. Louis, Mo.
Hunt Co., Inc., C. W., West New Brighton, N. Y.
Waterbury Co., New York, N. Y.
- Rope Drives.**
Caldwell & Son, H. W., Chicago, Ill.
Crescon-Morris Co., Philadelphia, Pa.
Jones & Laughlin Steel Co., Pittsburgh, Pa.
Waterbury Co., New York, N. Y.
Wood's Sons Co., T. B., Chambersburg, Pa.
- Rubber Goods.**
Electric Hose & Rubber Co., Wilmington, Del.
Eureka Fire Hose Mfg. Co., New York, N. Y.
Goodyear Tire & Rubber Co., Akron, Ohio.
- Rules. (Steel.)**
Lufkin Rule Co., Saginaw, Mich.
Starrett Co., L. S., Athol, Mass.
- Safes and Vaults.**
York Safe & Lock Co., York, Pa.
- Sand.**
Arundel Sand & Gravel Co., Baltimore, Md.
Balfour Quarry Co., Asheville, N. C.
Kirkpatrick Sand & Cement Co., Birmingham, Ala.
- Sand. (Foundry.)**
Newport Sand Bank Co., Inc., Newport, Ky.
- Sap Stain Preventive.**
Church & Dwight Co., New York, N. Y.
- Sash Chains.**
Niagara Falls Metal Stamping Works, Niagara Falls, N. Y.
- Saws.**
Gerlach Co., Peter, Cleveland, O.
Huther Bros. Saw Mfg. Co., Inc., Rochester, N. Y.
Smith Machine Co., H. B., Smithville, N. J.
Sydnor Pump & Well Co., Inc., Richmond, Va.
- Saws. (Band.)**
Smith Machine Co., H. B., Smithville, N. J.
- Saws. (Hack.)**
Starrett Co., L. S., Athol, Mass.
- Sawmill Dogs.**
Soule Steam Feed Works, Meridian, Miss.
- Sawmills.**
Gainesville Iron Works, Gainesville, Ga.
Gibbs Machinery Co., Inc., Columbia, S. C.
Knight Mfg. Co., Canton, O.
Lane Mfg. Co., Montpelier, Vt.
- Sawmill Machinery.**
Bailey-Lebby Co., Charleston, S. C.
Cameron & Barkley Co., Charleston, S. C.
Chase Turbine Mfg. Co., Orange, Mass.
Knight Mfg. Co., Canton, O.
Lane Mfg. Co., Montpelier, Vt.
Mecklenburg Iron Works, Charlotte, N. C.
Schofield Iron Works, Macon, Ga.
Southern Engine & Boiler Wks., Jackson, Tenn.
Sydnor Pump & Well Co., Inc., Richmond, Va.
- Saw Sharpeners.**
Carborundum Co., Niagara Falls, N. Y.
Vitrified Wheel Co., Westfield, Mass.
- Saw Sharpeners and Files. (Cotton Gin.)**
Carver Cotton Gin Co., East Bridgewater, Mass.
- Sawing Outfits. (Contractors and Industrial.)**
Rutland Foundry & Machinery Co., Bennington, Vt.
- Scales. (Weighing and Counting.)**
National Scale Co., Chicago, Ill.
- Scales. (Weighting and Counting.)**
National Scale Co., Chicago, Ill.
- Scrap Iron & Steel.**
Kander & Co., H., Bowling Green, Ohio
- Screens. (Fly, Window and Door.)**
Cincinnati Mfg. Co., Cincinnati, O.
New Jersey Wire Cloth Co., Trenton, N. J.
- Screens. (Mining, Stone, etc.)**
Converse Co., Inc., F. S., Lestershire, N. Y.
Erdie Perforating Co., Rochester, N. Y.
Hendrick Mfg. Co., Carbondale, Pa.
Jeffrey Mfg. Co., Columbus, O.
McLanahan-Stone Mach. Co., Hollidaysburg, Pa.
Mundt & Sons, Charles, Jersey City, N. J.
New Jersey Wire Cloth Co., Trenton, N. J.
- Screenings. (For Concrete and Road Construction.)**
American Ballast Co., Knoxville, Tenn.
- Screws. (Machine.)**
Progressive Mfg. Co., Torrington, Conn.
- Screws. (Safety Set.)**
Allen Manufacturing Co., Inc., Hartford, Conn.
- Searchlights.**
Carlisle & Finch Co., The, Cincinnati, Ohio.
Ft. Wayne Electric Works, Ft. Wayne, Ind.
- Separators. (Dust.)**
Buffalo Forge Co., Buffalo, N. Y.
Raymond Bros. Impact Pulv. Co., Chicago, Ill.
- Separators. (Steam.)**
Griscom-Russell Co., New York, N. Y.
- Sewer Flushing Siphons.**
Merritt Hydraulics Co., Philadelphia, Pa.
Pacific Flush Tank Co., New York, N. Y.
- Sewer Joint Compounds.**
Pacific Flush Tank Co., New York, N. Y.
- Sewer Pipes. (Vitrified.)**
Bannon Pipe Co., P., Louisville, Ky.
Bibb Sewer Pipe Co., Macon, Ga.
Blackmer & Post Pipe Co., St. Louis, Mo.
Cannelton Sewer Pipe Co., Cannelton, Ind.
Fomona Terra-Cotta Co., Fomona, N. O.
Southern Sewer Pipe Co., Birmingham, Ala.
Stevens Sons Co., H., Macon, Ga.
- Sewer Pipe and Drains. (Monolithic Concrete)**
Requarth Co., C. W., Charlotte, N. C.
- Sewage Pumping and Disposal Apparatus.**
Merritt Hydraulics Co., Philadelphia, Pa.
Pacific Flush Tank Co., New York, N. Y.
- Shafts. (Automobile)**
American Die & Tool Co., Reading, Pa.
- Shafting. (Cold Rolled Steel.)**
American Steel & Wire Co., Chicago, Ill.
- Shafting. (Polished Steel.)**
Jones & Laughlin Steel Co., Pittsburgh, Pa.
Medart Patent Pulley Co., St. Louis, Mo.
Republic Iron & Steel Co., Youngstown, O.
Union Drawn Steel Co., Beaver Falls, Pa.
- Shafting. [See Pulleys, Shafting and Hangers.]**
- Sharpening Stones.**
Carborundum Co., Niagara Falls, N. Y.
Vitrified Wheel Co., Westfield, Mass.
- Sheet, Brass and Copper.**
Humes & Co., C. G., Pittsburgh, Pa.
McKenna Bros., Brass Co., Pittsburgh, Pa.
- Sheet Metal Work.**
Atlas Metal Works, Dallas, Tex.
Birmingham Metal Products Co., Birmingham, Ala.
Danzon Metal Works, Hagerstown, Md.
Erie Culvert & Metal Co., Atlanta, Ga.
Lone Star Culvert Co., Houston, Tex.
McMillan Bros., Jacksonville, Fla.
Milwaukee Artistic Metal Ceiling Co., Milwaukee, Wis.
- Sheet Metal Works. (Metal.)**
Milwaukee Corrugating Co., Milwaukee, Wis.
Moeschl-Edwards Corrugating Co., Covington, Ky.
Salisbury Metal Culvert Co., Salisbury, N. C.
South Atlantic Blow Pipe & Sheet Metal Co., Savannah, Ga.
Tennessee Metal Culvert Co., Nashville, Tenn.
Virginia Metal & Culvert Co., Roanoke, Va.
Volkmann & Co., Chicago, Ill.
- Sheet Metal Working Machinery.**
Bliss Co., E. W., Brooklyn, N. Y.
- Sheet Steel and Iron.**
American Sheet & Tin Plate Co., Pittsburgh, Pa.
Cincinnati Iron & Steel Co., Cincinnati, O.
La Belle Iron Works, Steubenville, O.
Portsmouth Steel Co., Portsmouth, O.
Republic Iron & Steel Co., Youngstown, O.
Southern Sheet & Tin Plate Co., Ashland, Ky.
Tennessee Coal, Iron & R. R. Co., B'm'gh'm, Ala.
Wood Iron & Steel Co., Alan, Philadelphia, Pa.
Youngstown Sheet & Tube Co., Youngstown, O.
- Shelving. [(Steel) Vault, Store, Etc.]**
Merritt & Co., Camden, N. J.
- Shingles. (Metal.)**
Cortright Metal Roofing Co., Philadelphia, Pa.
Edwards Mfg. Co., Cincinnati, O.
Hydman Roofing Co., Cincinnati, O.
Milwaukee Artistic Metal Ceiling Co., Milwaukee, Wis.
- Shingles. (Wood.)**
Milwaukee Corrugating Co., Milwaukee, Wis.
Moeschl-Edwards Corrugating Co., Covington, Ky.
Southern Sheet & Tin Plate Co., Ashland, Ky.
- Shop Furniture. (Steel)**
Merritt & Co., Camden, N. J.
- Shovels. (Special for Any Purpose.)**
Conneaut Shovel Co., The, Conneaut, Ohio.
- Shovels. (Steel, Brass, Aluminum, etc.)**
Conneaut Shovel Co., The, Conneaut, Ohio.
- Shutters. (Iron.)**
Bolton Iron & Wire Works, J. E., Detroit, Mich.
Chesapeake Iron Works, Baltimore, Md.
- Shutters. (Steel Rolling.)**
Kinneer Mfg. Co., Columbus, O.
- Shutters. (Tin Clad.)**
Victor Mfg. Co., Newburyport, Mass.
- Shoes. (Metal.)**
Dixie Culvert & Metal Co., Atlanta, Ga.
- Skylights and Cornices.**
Danzon Metal Works, Hagerstown, Md.
Emporia Cornice & Skylight Works, North Emporia, Va.
- Slates. (Roofing, Sanitary, Structural, etc.)**
East Bangor Consol. Slate Co., East Bangor, Pa.
Genuine Bangor Slate Co., Easton, Pa.
Johnson, E. J., New York, N. Y.
- Sluice Gates and Appliances.**
Coldwell-Wileox Co., Newburgh, N. Y.
- Smokestacks. (Iron and Steel.)**
Chattanooga Boiler & Tank Co., Chattanooga, Tenn.
Des Moines Bridge & Iron Co., Des Moines, Ia.
Keeler Co., E., Williamsport, Pa.
Lombard Iron Works, Augusta, Ga.
Pittsburgh-Des Moines Steel Co., Pittsburgh, Pa.
Schofield Iron Works, Macon, Ga.
Virginia Bridge & Iron Co., Roanoke, Va.
- Soda. (Bicarbonate.)**
Church & Dwight Co., New York, N. Y.
- South American Trade.**
El Comercio, New York, N. Y.
- Speed Changers. (Variable.)**
Moore & White Co., The, Philadelphia, Pa.
- Speed Reducing Transmissions.**
James Mfg. Co., D. O., Chicago, Ill.
- Spikes. (Railroad.)**
Hoffman & Co., Inc., R. C., Baltimore, Md.
Newhall Eng. Co., Geo. M., Philadelphia, Pa.
- Spikes. [See Nails and Spikes.]**
- Spiral Stairs.**
Merritt & Co., Camden, N. J.
- Spring. (Machinery, Railway, Spiral.)**
Cory Spring Works, New York, N. Y.
Raymond Mfg. Co., Ltd., Corry, Pa.
- Stamp Mills.**
Mecklenburg Iron Works, Charlotte, N. C.
- Stamps. (Brass, Rubber, etc.)**
Baltimore Office Supply Co., Baltimore, Md.
- Standpipes.**
Chattanooga Boiler & Tank Co., Chattanooga, Tenn.
Chicago Bridge & Iron Works, Chicago, Ill.
Des Moines Bridge & Iron Co., Des Moines, Ia.
Hartley Boiler Works, Montgomery, Ala.
Keeler Co., E., Williamsport, Pa.
Pittsburgh-Des Moines Steel Co., Pittsburgh, Pa.
Struthers-Wells Co., Warren, Pa.
- Stapling Machinery. (Fruit Package, Basket, etc.)**
Sarnac Machine Co., Benton Harbor, Mich.
- Stationers. (Envelopes, Letter and Bill Heads, etc.)**
Young & Selden Co., Baltimore, Md.
- Steam Feeds.**
Soule Steam Feed Works, Meridian, Miss.
- Steam Fitters' Supplies.**
Oster Mfg. Co., The, Cleveland, Ohio.
Saunders' Sons, D., Inc., Yonkers, N. Y.
- Steam Heating.**
Keeler Co., E., Williamsport, Pa.
- Steamship Lines. (Coastwise.)**
Baltimore Steam Packet Co., Baltimore, Md.
Chesapeake Steamship Co., Baltimore, Md.
Detroit & Cleveland Navigation Co., Detroit, Mich.
Merchants & Miners' Trans. Co., Baltimore, Md.

Steamship Lines. (Trans Atlantic.)

Cunard Steamship Co., Ltd., New York, N. Y.

Steam Shovel Chains.

Wester Chain & Iron Co., Lebanon, Pa.

Steam Shovels.American Clay Machinery Co., The Bucyrus, Ohio.
Fairbanks Steam Shovel Co., Marion, O.
Marion-Osgood Co., Marion, O.
Marion Steam Shovel Co., Marion, O.
Sherwood, E. C., New York, N. Y.**Steam Specialties.**Lunkenheimer Co., The Cincinnati, Ohio.
Powell Co., Wm., Cincinnati, O.**Steam Traps.**

Jenkins Bros., New York, N. Y.

Steel.Carnegie Steel Co., Pittsburgh, Pa.
Dietrich Bros., Baltimore, Md.
Gulf States Steel Co., Birmingham, Ala.
Hoffman & Co., Inc., R. C., Baltimore, Md.
Jones & Laughlin Steel Co., Pittsburgh, Pa.
La Belle Iron Works, Steubenville, O.
Lackawanna Steel Co., Lackawanna, N. Y.
Lebanon Valley Iron & Steel Co., Lebanon, Pa.
Portsmouth Steel Co., Portsmouth, Ohio.
Republic Iron & Steel Co., Youngstown, O.
Tennessee Coal, Iron & R. R. Co., Birm'gh'm, Ala.
Union Drawn Steel Co., Beaver Falls, Pa.
Upson Nut Co., The Cleveland, O.
Union Iron & Steel Co., Alan, Philadelphia, Pa.
Youngstown Sheet & Tube Co., The Youngstown, O.**Steel (Tool).**Bourne-Fuller Co., The Cleveland, Ohio.
McKenna Bros., Brass Co., Pittsburgh, Pa.
Union Drawn Steel Co., Beaver Falls, Pa.**Steel (Vanadium).**Carnegie Steel Co., Pittsburgh, Pa.
Union Drawn Steel Co., Beaver Falls, Pa.**Steel Buildings.** (Designers, Builders.)Amer. Bridge Co., of New York, N. Y.
Belmont Iron Works, Philadelphia, Pa.
Champion Bridge Co., Wilmington, O.
Chesapeake Iron Works, Baltimore, Md.
Des Moines Bridge & Iron Co., Des Moines, Ia.
Phoenix Iron Co., Philadelphia, Pa.
Pittsburgh-Des Moines Steel Co., Pittsburgh, Pa.
Richmond Structural Steel Co., Richmond, Va.
Schreiber & Sons Co., The L., Cincinnati, O.
Snead Architectural Iron Works, Louisville, Ky.
Turner, G. A. F., Minneapolis, Minn.
Virginia Bridge & Iron Co., Roanoke, Va.**Steel Castings.**Orucible Steel Castings Co., Lansdowne, Pa.
Hoffman & Co., Inc., R. C., Baltimore, Md.
Riverside Steel Casting Co., Newark, N. J.**Steel Plate Work.**Casey-Hedges Co., Chattanooga, Tenn.
Chattanooga Boiler & Tank Co., Chattanooga, Tenn.
Cokeville Boiler Works, Cookeville, Pa.
Hoffman & Co., Inc., R. C., Baltimore, Md.
Memphis Steel Construction Co., Memphis, Tenn.
Phoenix Iron Co., Philadelphia, Pa.
Struthers-Weiss Co., Warren, Pa.**Steel Protector.** (Concrete Carb. Steps, etc.)

[See Carb Protector Steel.]

Steel Sheet Piling.Franks, J. E., Atlanta, Ga.
Jones & Laughlin Steel Co., Pittsburgh, Pa.
Lackawanna Steel Co., Lackawanna, N. Y.**Stencils.**Baltimore Office Supply Co., Baltimore, Md.
Stillis, (Turpentine.)**Stirrups.** (Building.)

Chesapeake Iron Works, Baltimore, Md.

Stock Certificates, Bonds and Seals.

Baltimore Office Supply Co., Baltimore, Md.

Stock Room Racks, Bins, Etc.

Merritt & Co., Camden, N. J.

Stokers. (Hand.)

Huber Grate Bar & Stoking Co., Baltimore, Md.

Stokers. (Mechanical.)Babcock & Wilcox Co., New York, N. Y.
Westinghouse Machine Co., Pittsburgh, Pa.**Stone.** (Building.)Bedford Steam Stone Works, Bedford, Ind.
Rickpatrick Sand & Cement Co., Birmingham, Ala.**Stone and Gravel Plants.**

Weller Mfg. Co., Chicago, Ill.

Storage Batteries.Elec. Storage Battery Co., The Philadelphia, Pa.
Westinghouse Machine Co., Pittsburgh, Pa.**Strapping Leather.**

Graton & Knight Mfg. Co., Worcester, Mass.

Structural Steel and Iron.Amer. Bridge Co., of New York, N. Y.
Belmont Iron Works, Philadelphia, Pa.
Bourne-Fuller Co., The Cleveland, Ohio
Carnegie Steel Co., Lackawanna, N. Y.
Champion Bridge Co., Wilmington, O.
Chesapeake Iron Works, Baltimore, Md.
Chickasaw Iron Works, Memphis, Tenn.
Chicago Bridge & Iron Works, Chicago, Ill.
Cincinnati Iron & Steel Co., Cincinnati, O.
Des Moines Bridge & Iron Co., Des Moines, Ia.
Dietrich Bros., Baltimore, Md.
East St. Louis Bridge Co., East St. Louis, Ill.
Easton Car & Construction Co., Easton, Pa.
Grainger & Co., Louisville, Ky.
Greenspan's Sons Iron & Steel Co., Jos., St. Louis, Mo.
Hoffman & Co., Inc., R. C., Baltimore, Md.
Jones & Laughlin Steel Co., Pittsburgh, Pa.
Lackawanna Steel Co., Lackawanna, N. Y.
Oregon Bridge Co., Lebanon, Ohio.
Memphis Steel Construction Co., Memphis, Tenn.
Phoenix Iron Co., Philadelphia, Pa.
Pittsburgh-Des Moines Steel Co., Pittsburgh, Pa.
Republic Iron & Steel Co., Youngstown, O.
Richmond Structural Steel Co., Richmond, Va.
Scaife & Sons Co., Wm. B., Pittsburgh, Pa.
Schreiber & Sons Co., The L., Cincinnati, O.
Snead Architectural Iron Works, Louisville, Ky.
Southern Sheet & Tin Plate Co., Ashland, Ky.
Savannah Steel Products Co., Savannah, Ga.
Tennessee Coal, Iron & R. R. Co., Birm'gh'm, Ala.
Vincennes Bridge Co., Vincennes, Ind.
Virginia Bridge & Iron Co., Roanoke, Va.**Stump Pullers.**

Zimmerman Steel Co., Lone Tree, Iowa.

Sulphur.

Union Sulphur Co., New York, N. Y.

Super-Heaters. (Steam.)Babcock & Wilcox Co., New York, N. Y.
Power Specialty Co., New York, N. Y.**Surfacing Machines.** (For Floors.)

Wayvill Chappell & Co., Chicago, Ill.

Surveying Instruments.

Weber & Co., F., Philadelphia, Pa.

Swing Engines.

Dake Engine Co., Grand Haven, Mich.

Switchboards, Switches, etc.Fort Wayne Electric Works, Fort Wayne, Ind.
General Electric Co., Schenectady, N. Y.**Switchstands.** [See Railroad Frogs and Switches.]**Switches.**

Weir Frog Co., Cincinnati, O.

Tackle Blocks. (For Wire or Manila Rope.)Broderick & Bascom Rope Co., St. Louis, Mo.
Talc and Soapstone Powders.

Georgia Talc Co., Ashville, N. C.

Tanks. (Iron and Steel.)American Bridge Co., New York, N. Y.
American Water Softener Co., Philadelphia, Pa.
Caldwell Co., Inc., W. E., Louisville, Ky.
Casey-Hedges Co., Chattanooga, Tenn.
Chattanooga Boiler & Tank Co., Chattanooga, Tenn.
Chicago Bridge & Iron Works, Chicago, Ill.
Cokeville Boiler Works, Cookeville, Pa.
Cote Mfg. Co., R. D., Newnan, Ga.
Des Moines Bridge & Iron Co., Des Moines, Ia.
Dixie Culvert & Metal Co., Atlanta, Ga.
Harry Bros. Co., Newport, Ky.
Hartley Boiler Works, Montgomery, Ala.
Keeler Co., R. Williamsport, Pa.
Keystone Boiler & Foundry Co., Columbia, Pa.
Lombard Iron Works, Augusta, Ga.
Lookout Boiler & Mfg. Co., Chattanooga, Tenn.
Memphis Steel Construction Co., Memphis, Tenn.
New Orleans Roofing & Metal Wks., New Orleans, La.
New York Central Iron Wks. Co., Hagerstown, Md.
Pittsburgh-Des Moines Steel Co., Pittsburgh, Pa.
Schofield Iron Works, Macon, Ga.
Struthers-Weiss Co., Warren, Pa.
Sydney Pump & Well Co., Inc., Richmond, Va.
Tennessee Metal Culvert Co., Nashville, Tenn.
Twin City Boiler Works, Bristol, Va.-Tenn.
Virginia Bridge & Iron Co., Roanoke, Va.
Walsh & Weidner Boiler Co., Chattanooga, Tenn.**Tanks.** (Wood.)Caldwell Co., Inc., W. E., Louisville, Ky.
Davis & Son, G. M., Palatka, Fla.
Sydney Pump & Well Co., Inc., Richmond, Va.**Tapes.** (Measuring.)Lufkin Rule Co., Saginaw, Mich.
Starrett Co., L. S., Athol, Mass.**Telephones.** (Supplies, Equipment.)Piedmont Electric Co., Asheville, N. C.
Western Electric Co., New York, N. Y.**Telephone Service.**

American Telephone & Telegraph Co.

Terra-Cotta. (Ornamental.)Atlanta Terra-Cotta Co., Atlanta, Ga.
Bibb Sewer Pipe Co., Macon, Ga.
Maryland Terra-Cotta Co., Baltimore, Md.
Pomona Terra-Cotta Co., Pomona, N. C.
Southern Building Material Co., Norfolk, Va.
Stevens' Sons Co., H., Macon, Ga.**Threshers.**

Cardwell Machine Co., Richmond, Va.

Tiering Machines. (Portable.)

Economy Engineering Co., Chicago, Ill.

Tile. (Drain.)Bibb Sewer Pipe Co., Macon, Ga.
Gray Concrete Co., Thomasville, N. C.
Oconee Brick & Tile Co., Milledgeville, Ga.**Tile.** (Interior)Amer. Enam. Brick & Tile Co., New York, N. Y.
P & F Tile Co., Birmingham, Ala.**Tile.** (Mantel and Promenade.)

Hood Brick Co., B. Miffin, Atlanta, Ga.

Tile. (Rubber.)

Goodyear Tire & Rubber Co., Akron, O.

Tile. (Structural)Bibb Sewer Pipe Co., Macon, Ga.
Oconee Brick & Tile Co., Milledgeville, Ga.**Timbers.** (Crescoted.)American Crescoted Works, New Orleans, La.
Republic Crescoting Co., Indianapolis, Ind.**Tin and Terne Plates.**

American Sheet & Tin Plate Co., Pittsburgh, Pa.

Tires. (Rubber.)

Goodyear Tire & Rubber Co., Akron, O.

Tobacco Machinery.Buckeye Iron & Brass Works, Dayton, O.
Cardwell Machine Co., Richmond, Va.**Toilet Flushing Device.**

Duffy & Sons Co., M. J., Louisville, Ky.

Tools. (Machinists')American Die & Tool Co., Reading, Pa.
Holland Mfg. Co., Erie, Pa.
Morris Twist Drill & Mch. Co., New Bedford, Mass.**Tools.** (Mechanical.)

Starrett Co., L. S., Athol, Mass.

Tools. (Pneumatic.)Amer. Compressor & Pump Co., Baltimore, Md.
Chicago Pneumatic Tool Co., Chicago, Ill.
Independent Pneumatic Tool Co., Chicago, Ill.**Tools.** (Tinner's')

Danner Metal Works, Hagerstown, Md.

Towers.

Wall Mfg. Supply Co., P., Allegheny, Pa.

Towers. (Electric Transmission.)American Bridge Co., of New York, N. Y.
Scaife & Sons Co., Wm. B., Pittsburgh, Pa.**Towers.** (Steel and Wood.)Caldwell Co., Inc., W. E., Louisville, Ky.
Chattanooga Boiler & Tank Co., Chattanooga, Tenn.
Chicago Bridge & Iron Works, Chicago, Ill.
Cote Mfg. Co., R. D., Newnan, Ga.
Columbia Pump & Well Co., Washington, D. C.
Des Moines Bridge & Iron Co., Des Moines, Ia.
Memphis Steel Const. Co., Memphis, Tenn.
Pittsburgh-Des Moines Steel Co., Pittsburgh, Pa.**Track Material.** (Steam & Industrial Railroads.)

Conley Frog & Switch Co., Memphis, Tenn.

Traction Engines.Fairbanks-Morse & Co., Atlanta, Ga.
Heer Engine Co., Portsmouth, U.
Holt Mfg. Co., The, Peoria, Ill.
Huber Mfg. Co., The, Marion, O.**Tramway.** (Overhead.)Consolidated Tramway Co., New York, N. Y.
Speidel, J. G., Reading, Pa.**Tramways.** (Portable.)

Consolidated Tramway Co., New York, N. Y.

Tramway. (Wire Rope)Broderick & Bascom Rope Co., St. Louis, Mo.
Caldwell & Sons Co., H. W., Chicago, Ill.
Consolidated Tramway Co., New York, N. Y.
Link-Belt Co., Nictown (Philadelphia), Pa.
Waterbury Co., New York, N. Y.**Transformers.**

Crocker-Wheeler Co., Ampere, N. J.

Translation.

El Comercio, New York, N. Y.

Trench Excavator. [See Excavator (Trench).]**Trucks.** (Dry Kiln.)

Moore Dry Kiln Co., L., Jacksonville, Fla.

Trucks. (Elevating for Factories, etc.)

National Scale Co., Chicopee Falls, Mass.

Trucks. (Motor, Gasoline.)

White Co., The Cleveland, O.

Trucks. (Platform, Freight, Mill, Factory, etc.)Bernstein Mfg. Co., Phila., Pa.
Chase Fdry. & Mfg. Co., Columbus, O.**Trucks.** (Storage Battery Auto.)

Westinghouse Machine Co., Pittsburgh, Pa.

Trucks. (Storage Battery) [For Warehouses & Industrial Plants]

Elwell Parker Electric Co., The, New York, N. Y.

Trust Companies. [See Bankers and Brokers.]**Tube Well Strainers.**

Cook Well Co., St. Louis, Mo.

Tubes. (Boiler.)Cincinnati Iron & Steel Co., Cincinnati, O.
National Tube Co., Pittsburgh, Pa.**Tubing.**La Belle Iron Works, Steubenville, O.
National Tube Co., Pittsburgh, Pa.
Youngstown Sheet & Tube Co., Youngstown, O.**Turbines.** (Hydraulic.)Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Davis Foundry & Machine Wks., Rome, Ga.
Lefell & Co., James, Springfield, O.
Poele Engineering & Mach. Co., Baltimore, Md.
Salem Foundry & Machine Wks., Salem, Va.
Smith Co., S. Morgan, York, Pa.**Turbines.** (Steam.)Allis-Chalmers Mfg. Co., Milwaukee, Wis.
De Laval Steam Turbine Co., Trenton, N. J.
F. Wayne Electric Co., Wayne, Ind.
General Electric Co., Schenectady, N. Y.
Sturtevant Co., B. F., Hyde Park, Boston, Mass.
Terry Steam Turbine Co., Hartford, Conn.
Western Electric Co., New York, N. Y.
Westinghouse Machine Co., Pittsburgh, Pa.

Important Information For Advertisers in Manufacturers Record

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When proof is required, two weeks in advance.

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TYPOGRAPHICAL ARRANGEMENT

We desire to use, as far as possible, uniform display type and borders and avoid the use of black background cuts. The uniform border is two-point plain rule for all spaces less than a full page.

Copy for advertisements other than those to be used in special departments should be prepared for two-column measure for spaces less than a quarter page; for a quarter page or larger, in two or four columns.

Turn Buckles.

Broderick & Bascom Rope Co., St. Louis, Mo.

Turntables.American Bridge Co., New York, N. Y.
Easton Car & Construction Co., Easton, Pa.
Virginia Bridge & Iron Co., Roanoke, Va.**Twines.**Columbian Rope Co., Auburn, N. Y.
Plymouth Cordage Co., North Plymouth, Mass.**Unions.**Dart Mfg. Co., E. M., Providence, R. I.
National Tube Co., Pittsburgh, Pa.**Vacuum Cleaning Apparatus.**King Co., F. E., Norfolk, Va.
United Electric Co., The, Canton, O.**Valves.**Bourbon Copper & Brass Wks. Co., Cincinnati, O.
Columbian Iron Works, Chattanooga, Tenn.
Frick Co., The, Waynesboro, Pa.
Glanorgan Pipe & Fdry Co., Lynchburg, Va.
Jenkins Bros., New York, N. Y.
Lunkenheimer Co., The, Cincinnati, O.
National Tube Co., Pittsburgh, Pa.
Powell Co., Wm., Cincinnati, O.
Pittsburgh Valve Fdry. & Const. Co., Pittsburgh, Pa.**Valve Boxes.**

Clark Co., H. W., Mattoon, Ill.

Varnish.Berry Bros., Detroit, Mich.
Murphy Varnish Co., Newark, N. J.**Veneer Machines.**

Titus, E. E., Petersburg, Va.

Ventilators.

Moeschl-Edwards Corrugating Co., Covington, Ky.

Ventilating Apparatus. (Engineers' and Contractors')Buffalo Forge Co., Buffalo, N. Y.
Sturtevant Co., B. F., Hyde Park, Boston, Mass.**Vises.**

Holland Mfg. Co., Erie, Pa.

Wagons. (Dump.)Troy Wagon Works Co., The, Troy, O.
Western Wheeled Scraper Co., Aurora, Ill.**Wainscoting.** (Tile.)

Northcross Mantel Co., W. J., Memphis, Tenn.

Wall Coping.

Southern Sewer Pipe Co., Birmingham, Ala.

Wall Plugs. (Galvanized.)

Niagara Falls Metal Stamping Works, Niagara Falls, N. Y.

Wall Ties.

Niagara Falls Metal Stamping Works, Niagara Falls, N. Y.

Page Woven Wire Fence Co., Adrian, Mich.

Washers. (Ore and Phosphate.)Bailey-Lobby Co., Charleston, S. C.
Cameron & Barkley Co., Charleston, S. C.
McLanahan-Stone Mach. Co., Hollidaysburg, Pa.**Washers and Rivets.** [See Bolts, Nuts, Rivets, Studs and Washers.]**Watchman's Clocks.**

Watchman's Clock & Supply Co., New York, N. Y.

Water Filtration. (See Filtration, Water, etc.)**Waterproofing.** (For Brick Work.)Barrett Mfg. Co., Philadelphia, Pa.
McCormick Waterproof Portland Cement Co., St. Louis, Mo.
Standard Paint Co., The, New York, N. Y.**Waterproofing.** (For Concrete.)Barrett Mfg. Co., Philadelphia, Pa.
McCormick Waterproof Portland Cement Co., St. Louis, Mo.
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Oliver & Sons, James B., Chicago, Ill.
Coldwell-Wilcox Co., Newburgh, N. Y.
Columbian Iron Works, Chattanooga, Tenn.
Donaldson Iron Co., Ensus, Pa.
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Layne & Bowler Co., Houston, Tex.
Leadite Co., Inc., The, Philadelphia, Pa.
Lynchburg Foundry Co., Lynchburg, Va.
Mason Iron & Steel Co., Mason, Ohio.
Pomona Terra-Cotta Co., Pomona, N. C.
Salem Fdry. & Machine Works, Salem, Va.
Standard Cast Iron Pipe & Foundry Co., Bristol, Pa.
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Stevens' Sons Co., H., Macon, Ga.
U. S. Cast Iron Pipe & Fdry. Co., Burlington, N. J.
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Alumina Co., Inc.	9	Cincinnati Frog & Switch Co.	87	Gallon Iron Wks. & Mfg. Co.	98	League City Land Co.	101	Perkins Engr. Co., Edmund T.	24	Stirling Wheelbarrow Co.	10
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American Cast Iron Pipe Co.	101	Clark, C. J. Shepherd	2	General Electric Co.	106	Leffell & Co., James	104	Phoenix Iron Co.	35	Stewart Heater Co., The	10
American Die & Tool Co.	107	Clark Co., H. W.	2	General Vehicle Co.	106	Lehigh Portland Cement Co.	28	Phoenix Iron Works Co.	106	Stone & Webster Eng. Corp.	10
American Compressor & Pump Co.	10	Cleland Belting & Mch. Co.	84	Genuine Bangor Slate Co.	106	Lehman, Chas. T.	84	Pickering Governor Co.	5	Stothoff Bros.	10
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BALTIMORE

ILLUSTRATED EDITION
MANUFACTURERS RECORD



The United Railways and Electric Company

OF BALTIMORE

As a Developing Agency

THE United Railways Company of Baltimore, operating over 400 miles of most substantially built road with 236 miles within the city limits and 167 miles in the adjacent suburban districts, serves a population of 700,000 people or more. Vitrally interested in everything that pertains to the advancement of Baltimore and the surrounding country, the United Railways Company would especially call attention to the fact that there is no other city in America possessing so many advantages for industrial development, for enlarged business operations, and as a place of residence.

The unexcelled transportation facilities furnished to the people of Baltimore enable the man of moderate means to live in the suburbs or in the surrounding country, and still be able to get to his place of work at any hour and at a small cost. This has avoided the congestion of population which exists in so many cities, and has resulted in the building of many thousands of inexpensive homes where the man of limited income can own or rent a house with all modern improvements without the necessity of being crowded into congested tenement districts.

Every part of the city is easily accessible over one or more of the lines of the Company, while the lines of the system extend to Bay Shore on the east, 15 miles from the centre of the city; to Ellicott City on the west, 11 miles from the same point; to Curtis Bay on the south, 6 miles from the centre of the city, and to Emory Grove on the north, 20 miles from the same point, with intermediate lines to other outlying districts.

This company pays to the city for the purchase and maintenance of public parks 9% of its gross receipts, the contribution now amounting to about \$600,000 a year. The money thus obtained has enabled the city to develop one of the greatest park systems in America, giving to the poor as well as to the rich unsurpassed opportunities for enjoying the pleasures of a great system of public parks and squares.

In the year 1913 the total number of revenue passengers who rode on the cars of the United was 182,180,767, of which number 74,634,030 used transfers—that is, about 41% of the revenue passengers availed themselves of the free transfer privilege.

The major portion of the cars used for the transportation of these passengers is of the modern double truck semi-convertible air brake type.

Eighty-five new cars of this type with enclosed vestibules and folding steps are now being received from the builders, which will greatly add to the accommodation of passengers.

It is only by comparison that we can adequately understand the meaning of statistics that tell of the development of a city or a country. We are indebted to the Manufacturers Record for being able to present the following striking facts in regard to this city.

In the area served by this road in and around Baltimore the total capital invested in manufacturing is \$270,000,000, and the value of the manufactured products now amounts to \$352,000,000 a year.

The magnitude of the value of this output can be better understood when it is remembered that this is equal to 58% of the value of last year's wheat crop for the entire country raised on over 50,000,000 acres of land.

It is more than one-third of the total value of the entire cotton crop of the South which last year aggregated over \$1,000,000,000.

It is equal to nearly one-half of the value of the hay crop of the United States raised on 48,000,000 acres of land, and nearly three times the total value of the tobacco crop of the United States. It is more than \$100,000,000 in excess of the total value of the Irish potato crop of the country.

When these facts are considered one gets a better comprehension of the vast industrial activities of Baltimore which make possible an output so large as compared with that of the wheat crop, or the cotton crop, or of other crops raised on millions of acres of land, and upon which the welfare of the nation so largely depends.

The value of the coastwise and domestic water-borne trade of the port of Baltimore was in 1913 \$439,000,000.

Baltimore has the largest iron and steel plant, including a great shipyard, at any tidewater point in the United States, representing an investment of a great many millions of dollars.

Baltimore has the largest copper smelting plant in the world, and exports more than \$40,000,000 worth of copper a year.

Baltimore manufactures more than \$36,000,000 worth of clothing, and one of its clothing factories is said to be the largest individual clothing factory in the world.

Baltimore has a sulphuric acid plant that is said by experts to be the largest in the world.

Baltimore has the largest concern in the world manufacturing bottle stoppers and bottle sealing caps, with an investment of some millions of dollars and having a number of exceptionally large factories.

Baltimore has what is admitted by the foremost experts of this and other lands to be, all things considered, the finest suburban development in this or any other country, covering 1000 acres of land and representing in the ultimate outlay for street and roads and land and buildings, about \$40,000,000 according to the reports of officials as to what has already been done and the plans for the future.

Baltimore is the largest oyster market in the world.

Baltimore has in course of expenditure, covering the last five or six years and to be completed within the next five or six years, municipal improvements including repaving of the whole city, a new sewerage system and municipal dock system and other improvements, over \$60,000,000.

Baltimore has a hospital that is generally esteemed as the foremost in the United States.

Baltimore has the best food supply from nearby sources and at the lowest cost of any place in the United States.

Baltimore has better home-making advantages for the day laborer, the mechanic, the business man and the capitalist than any other place in this country.

A careful study of the statements here made, in connection with Baltimore's admirable street railway facilities, should appeal to every man who is looking for the best place in which to work, or to do business, and the best place in which to rear a family.

Come to Baltimore and you will find a city equipment ready for every requirement of commerce and home life.

The United Railways and Electric Company of Baltimore

WM. A. HOUSE, President



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BALTIMORE: AS IT WAS; AS IT IS; AS IT WILL BE

BALTIMORE, SEPTEMBER 3, 1914

MANUFACTURERS RECORD

PUBLISHED EVERY THURSDAY BY THE
MANUFACTURERS RECORD PUBLISHING COMPANY

RICHARD H. EDMONDS, Editor

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Baltimore

As It Was; As It Is; As It Will Be

ABOUT \$400,000, have been expended in the rebuilding and expansion of Baltimore, if we include work now under way and the enlargement of railroad facilities in nearby territories, since 1904, when the great fire swept through the heart of the city. In that period nearly \$170,000,000 have been expended within the city limits in building operations, while many other millions have been spent for similar work in suburban operations just beyond the city limits.

During this ten-year period the city has been the center of vast activities in municipal improvements. A sewerage system, now nearing completion, is being built at an expenditure on the part of the city of nearly \$25,000,000, and sewerage connections which have been and are being made by individual property owners will add about \$12,500,000 to this sum.

In the repaving of the city, which is being done on a wholesale scale, changing Baltimore from one of the worst paved cities of its size in America to the best paved, more than \$14,000,000 are in course of expenditure.

An expansion and purification of the water supply of Baltimore is being made at a cost of \$5,000,000.

A municipal dock system has been begun, and upon it over \$7,000,000 have thus far been expended.

All electric-light and telephone wires are being put under ground in a municipally-owned conduit system at a cost of several million dollars.

The State of Maryland has for the last four or five years been building, at a cost which will aggregate about \$15,000,000, a State highway system, the center of which will be almost in the business heart of Baltimore. From that central point will radiate to every section of the State the lines of this splendid highway system, and though the expenditure is being made by the State, the city will,

with the State, share in the limitless benefits arising from this work.

Within ten years over \$5,000,000 have been expended upon the purchase, development and maintenance of a park system, which even before 1904 had made this city known throughout the world for the beauty of its parks. Baltimore now has nearly 2500 acres in parks easily worth in dollars over \$25,000,000, and in value to the people of the city many times that sum.

The street-railway system has within the period under review expended \$20,000,000 or more for betterments and extensions.

In the last five years the Baltimore & Ohio Railroad has expended nearly \$100,000,000 in extensions, in betterment work and the enlargement of its terminal facilities, the building of new docks and piers and wharves and warehouses, and in putting its entire system in better shape to concentrate at Baltimore traffic of that region of limitless resources and of almost boundless wealth through which it runs from Baltimore through the heart of the world's coal field in West Virginia and Eastern Kentucky, and on to the heart of the world's metallurgical development in Pittsburgh, and thence to Chicago and the other great centers of Western activity.

Ten years ago the Western Maryland Railroad was only a short, inadequately equipped and badly built local line doing only a local business. Through the expenditure of millions of dollars by the Gould-Rockefeller interests, who now control this road, it has been extended westward through the West Virginia coal fields and the Connellsville district of Pennsylvania to Pittsburgh connections. It has become a great through system whose value to Baltimore it is difficult to estimate, for it makes tributary to this city one of the richest mineral regions of the world, as well as the Pittsburgh district, the center of the greatest industrial activities of America. Millions have been expended by the new owners in the development of its terminal facilities, and the building of piers and wharves and warehouses, and in equipping this line by roadbed, by rolling stock and terminals with the facilities needed for a road draining such an empire of wealth.

The Pennsylvania Railroad, with a view to meeting increased traffic through this city, has been spending many millions of dollars in the building of new concrete bridges in and nearby this city, in the betterment of its roadbed and the expansion of its terminal facilities. Its plans now look to the expenditure in the near future of about \$10,000,000 in the heart of Baltimore for the vast extension of its warehousing and general terminal facilities.

It is with a view to dealing somewhat broadly with these revolutionizing improvements that this publication is issued. It was not intended that it should go into all details or attempt to cover the general business activities of the city, to tell of the dry goods trade, or of the grocery trade, or even of the vast manufacturing interests that make Baltimore one of the great manufacturing centers of the country. It is to be taken for granted that the intelligent business men of the country, as well as the people of Baltimore, know about these things. They know how the trade of the city has been expanding in the South and the West and the North. They know how its foreign commerce has been rapidly

increasing, how its harbor has been deepened, and how still greater depth is to be given and new channels to be provided. They know how mercantile and industrial enterprises of great pith and moment have been created as illustrated in the history of one dry goods house whose annual trade now exceeds \$16,000,000, and which last year increased nearly two and a half million over the preceding year. Of these things time and space are inadequate to speak in detail.

It is the constructive upbuilding work—the creation of a new plant, if city facilities may be so called—which has been going on during the last ten years that is outlined in the following pages.

In that time Baltimore has built more than 23,000 dwellings—a city in itself; its transportation facilities have been enormously expanded; its municipal improvements are the most modern and up to date to be found in this or any other land; its park system, with a present income of about \$600,000, arising from a 9 per cent. tax on the gross receipts of the street-railway system, is gradually building up here one of the greatest park and boulevard systems to be found anywhere in this or any other country.

These are the things which it has been deemed wise should be made the theme of this publication. People outside of Baltimore know comparatively little as to what has been going on here in the revolutionizing work which is changing a cobble-stone paved city of five years ago into the best paved city in America; which is giving this city the best sewerage system, according to the views of experts, to be found anywhere, and which is providing the enlarged terminal facilities for the railroad systems which are handling an ever-increasing trade to and from this city.

A wonderful development of its suburban activities has been under way, giving to Baltimore what is pronounced the most perfectly rounded-out suburban development known.

A great advance has been made in the educational equipment of this city and in the extension of its hospital facilities, which are commanding ever-widening attention throughout the world.

Baltimore has entered upon a new epoch. The old Baltimore has passed away. The new, or the reborn Baltimore, virile, vigorous, with a world-horizon, has taken its place.

It has seemed, therefore, to the MANUFACTURERS RECORD that the time is opportune by picture and by word to make these facts known to the world. This is the reason why this illustrated story of constructive activities of the last ten years is given to our readers that other cities may learn how such reconstruction work may be carried on without interfering with the orderly running of business. Every town and city official in the country, every engineer, every business man, wherever he may live, interested in the progress of his own community, will here find many facts of vital importance as to the building and the rebuilding of a city.

The Wide Sweep of Baltimore's Opportunities

WE have been so long accustomed to think of Baltimore's relation to the South by virtue of proximity as the chief center of its business activities that the fact that Baltimore is nearer to many of the great cities of the West than are New York and Boston has been overlooked. It is not generally known, or at least if it is known its significance has not been fully taken into account, that Baltimore is nearer to Buffalo than is New York, and is nearer to Buffalo than is Boston by nearly 100 miles. Baltimore is 126 miles closer to Chicago than is New York, and 220 miles closer than Boston. With Cincinnati, Cleveland and Columbus, Baltimore has the same relative advantages in the matter of distance; and even when we go farther West to Michigan we find that Grand Rapids is closer to Baltimore by 72 miles

than it is to New York, and closer to Baltimore by 130 miles than to Boston. St. Louis, the dominating financial and business center of the Southwest, is 137 miles nearer to Baltimore than it is to New York. Pittsburgh, the metallurgical heart of the world, is 127 miles nearer to Baltimore than to New York, and is 35 miles nearer to Baltimore than it is even to Philadelphia.

These facts in regard to the distances between this city and the stretch of country that reaches from Buffalo out to Grand Rapids, and down through the Southwest to St. Louis, are indicative of the vast possibilities of this city in that highly-developed region for the increase of trade as compared with the advantages of New York and Boston. Baltimore has thus to the North and West a wide, sweeping territory of enormous extent, of vast population, and almost limitless business activities in which to expand its trade. The territory covered in this sweep is the richest and most populous region of America considering industrial and agricultural developments combined.

Turning from this Northwestern and Western region made available by reason of distance to Baltimore trade to better advantage than New York or Philadelphia, we come to the South. Stretching from West Virginia down through Kentucky and Tennessee in the mountain regions through the Piedmont region of the Carolinas and Georgia, the coast country all the way down to the Mississippi, is a region which for natural advantages is unmatched on earth. Here is the very heart of the world's coal field, West Virginia alone having twice as much coal area as Great Britain; and Eastern Kentucky, the development of which is now so largely dominated by Baltimore capitalists, having the greatest high-grade coking coal field known to mankind. Through these States, as well as in Virginia, the Carolinas and Georgia and Alabama, with their vast wealth of minerals, and timbers, and water-powers, Baltimore's trade has a dominating hold which no rival can ever take from it.

Here is a region whose expansion is constantly adding to the power and wealth of this city. Every new acre put under cultivation in the South, every new mine opened, every new furnace started, every cotton mill built, enlarges the market in which Baltimore holds a pre-eminent position. From this region it can draw limitless raw materials for the widest range of manufactures; into this region it can pour an ever-increasing volume of trade. The development of its manufactures and the development of its trade in and with the South adds to the prosperity of both, so that they go hand in hand; the prosperity of one means the prosperity and advancement of the other.

Baltimore and the South are united for almost limitless progress in material development and wealth creation. The extent to which the material progress of the South can be developed cannot be adequately told. The resources of that section are so great that they defy presentation. And yet no one can question the statement that with its almost limitless raw materials of coal and iron and granites and marbles and phosphate and oil and gas and sulphur and clays, and a thousand and one other things, with its great agricultural capabilities and its splendid water-powers, the South could easily support a population as dense as the average per square mile of Pennsylvania, Ohio and Massachusetts. No one for a moment suggests that these States are overcrowded, but when the population of the South averages as much per square mile as that of the States named, this section will have over 150,000,000 people as compared with the 33,000,000 of today. This section has the resources and the area which would easily support a population much beyond 150,000,000 and which would furnish the basis for a far larger industrial development than that of the United States of today, and a far greater wealth than that of the whole country, notwithstanding the fact that this country leads all the nations of the world in wealth.

Baltimore Broadly Viewed By Mayor Preston

By HON. JAMES H. PRESTON, Mayor of Baltimore.

A recapitulation of the expenditures made by the city of Baltimore since the fire in 1904 in betterments, extensions and improvements from bond issues will be as follows:

Sewerage expenditures made by the municipality.....	\$23,500,000
To which must be added house connections made by the property owners, 125,000 houses at an average cost of \$100 per house.....	12,500,000
Improved water dam and filtration plant and land.....	5,000,000
Docks and piers, water-front streets.....	7,000,000
Paving, old city and annex.....	14,000,000
Electrical subways, \$500,000 per annum for six years.....	3,000,000
Loan for school buildings, including Polytechnic.....	2,000,000
Total.....	\$67,000,000

To which must be added an enormous sum which has been expended by the Gas & Electric Co., the Telephone Company and the Street Railways Company for structures and sub-surface structures in advance of the improved paving.

For this work in 1914 I had in bank on the first day of July, after having paid bills for the previous six months, a cash balance of \$6,000,000, and will provide for an expenditure for the whole of the year 1915 approximately \$9,000,000, which does not include, of course, the yearly permanent administrative expenses.

A consideration of the physical growth of Baltimore will naturally begin at the period immediately following our great fire. This fire left 140 acres in the heart of our city vacant and caused a loss of \$75,000,000. When the problem of rebuilding the city was presented thoughtful minds came to the conclusion that the first and primary thing to be done was the construction of a sewerage system. I think no one realized that this meant ultimately a reconstruction of an old city into a new city, for with the determination to install a completely new and modern sewerage system must necessarily follow a reconstruction of our streets, and a new installation or repair of all of the sub-surface structures, whether belonging to the municipality or to the public service corporations. It soon became apparent that owing to the necessarily defective back-fill in the trenches created by the sewerage conduits, that the structures of the Water Department, of the Gas Company, and of the Electrical Conduit Commission, and of the Telephone Company, would have to be repaired or replaced, and that the surface of the streets in many cases were left in such condition as would require a complete repaving. The conclusion was irresistible, that not only must our entire sub-surface structures be renewed or repaired, but that also the surface of the streets in many cases must be renewed or extensively repaired.

It was concluded then to entirely repave all the streets in Baltimore for two reasons. First, because our cobble streets had long been a reproach to us, and all classes of citizens desired to have them removed; and secondly, because the conditions of the sub-structures, occasioned by the sewers and high-pressure fire line and the electrical conduits, rendered extensive repairs necessary, and it was considered more effective to repave entirely.

Baltimore, therefore, so far as its streets are concerned, is converting an old city into a new city by a complete installation of a sanitary sewerage system and a storm water sewerage system, connecting each of the one hundred and fifty thousand houses of the city with the most modern and expensive sewerage system in the world, and of repaving all of its streets with a modern and scientific street-paving system, comprising all the alleys and streets in the city and the repair and replacement of all the sub-surface structures.

Neither of these two things has ever been done before in any great city, so far as my knowledge goes.

Our sewerage system will cost us \$23,500,000, \$20,000,000 of which will have been spent at the end of the year 1914, leaving the system to be entirely completed by the expenditure of \$3,500,000 in 1915.

The sewage is conducted through great outfall and intercepting sewers, is pumped to the disposal plant at Back River, and after having been passed through the disposal beds and subjected to bacterial action, the effluent is poured into Back River 99 per cent. pure, or in better condition than the river water itself.

As a part of this great system, the tunnel under Guilford avenue is just now being completed and will be turned over to the city this fall by the contractors. This is the greatest drainage tunnel in the world; has a perpendicular diameter of 29 feet, and was visited and approved as a great engineering feat by the American Society of Engineers in June of this year.

The writer in the year 1906 called the attention of Mr. Calvin W. Hendrick, chief engineer of the Sewerage Commission, to the advisability of incorporating Jones Falls, then an open sewer, 70 feet wide, running through the center of the city, into a part of Baltimore's proposed sewerage system. No money had been provided at this time sufficient to cover this construction,

and it was thought doubtful whether the city authorities and the people would feel justified in making the additional financial outlay necessary to construct conduits in the bed of the falls and erect a street on top of the conduits. I, however, formed the Jones Falls Improvement Association; was elected president of it; the late Ferdinand C. Latrobe, vice-president—the sole purpose of which association was to secure the construction of conduits in the bed of the falls and placing a wide ornamental traffic street over these conduits.

In the course of my investigations on this subject, I found that a hundred years ago similar recommendations had been made by an engineer then residing in Baltimore. And this first recommendation was followed some years later by a comprehensive plan for covering over Jones Falls by Mr. Winans, the then City Engineer, and that this was followed, subsequently, by the strong recommendations of Major Hutton, then engineer of the Harbor Board, recommending similar action, and accompanied with elaborate data and details.

The Jones Falls Improvement Association made an exhaustive campaign on the subject and obtained the endorsement of all public bodies, business associations, trade bodies and commercial organizations, receiving unanimous approval of the plan.

Largely owing to the efforts of Mr. Francis King Carey, an enabling act providing for an appropriation of money was obtained from the Legislature, which was ratified by the people, and the work started.

In 1911 I had the honor of laying the first stone in the construction of this street, and we will finish it in the autumn of this year.

I regard the solution of the problem of carrying off the water of Jones Falls, the construction of the conduits in the bed of the falls, and the erection and construction of the street on top of this conduit, from Baltimore street to Mt. Royal avenue, next to the installation of the entire sewerage system and the repaving of the entire city, as the most important physical construction ever undertaken in Baltimore.

The cost of this work, amounting to only about \$2,000,000, has resulted in a beautiful open traffic driveway 75 feet wide, free from steam or electric cars, at a very low grade, increasing enormously the value of the property fronting thereon at expense less than the cost of the old marble retaining walls put up under one of the administrations of Mayor Latrobe.

The paving in the city of Baltimore has been under a mixed system, no part of which has been scientifically correct. The paving in the northern and western annex has been done exclusively by bond issues, relying upon the increase in valuation of the property and the reclassification of the property to pay for the cost of the paving.

In the city proper it was done in part by bond issues, without contribution by the abutting property owners, in part by a contribution on the part of the adjoining property owners and in part by the property owners themselves, without assistance from the municipality.

When the plan was determined upon to repave the entire city, streets and alleys, with modern smooth paving, a comprehensive scheme was imperative. Consequently the present paving plan of having the city and property owners contribute equally to the funds for paving, by imposing a paving tax, was adopted, the proceeds of which, added to the bond issue, will produce sufficient funds to carry out the program.

This means an expenditure of \$10,000,000, of which \$5,000,000 is produced by a bond issue, \$5,000,000 from a tax on the property owners abutting on the improved pavements, whether laid now or formerly put down, with a contribution by the railways company to the amount of the cost of the construction of the paving in the area occupied by them in the public streets.

The most important development of American cities, more important than sewers and good paving, is the necessity for clean water.

Almost all American cities have installed, or are installing filtration systems, whether by the old slow sand process or by mechanical filters, either of which seems to be efficient.

Baltimore is taking a forward step in this direction. We are increasing fourfold our water supply and storage capacity, and installing the most modern and highly efficient mechanical filter system in the United States.

This will cost us certainly \$5,000,000, but when we observe the experience of other cities in the reduction of the death rate from typhoid and kindred diseases, when the efficiency of the individual is so tremendously increased by the improved health conditions, both from the use of drinking water and the use of water for street cleaning and the sanitary sewers flushing, the price would not be too high if it were many times this sum.

The possibilities of modern filters may be more advantageously observed at the great cities on the Mississippi, such as St. Louis, where the turbid waters are as muddy as a yellow country mill-stream after a rain storm. There we see the effluent, after coming through the sand filters and after the introduction of alum and hypo in small quantities, come out finally as sparkling, brilliant and clean as the mountain rill.

I believe that the future of Baltimore is dependent on her foreign commerce and domestic coastwise trade through her harbor. The municipality has spent and is spending about \$7,000,000 in our inner harbor in the development of coastwise trade, and on the sixth of July we had turned over to us from the contractor the new Broadway Pier, extending five hundred feet into our inner harbor, at the foot of Broadway, admirably equipped for the needs of coastwise and foreign shipping.

This pier cost us a million dollars, but it is to our outer harbor, or Spring Gardens, that the future shipping in Baltimore is most concerned.

The inner harbor from Fort McHenry and Broadway to Light street is already occupied and congested, and the expansion must take place in the outer harbor, Canton Hollow on the east, South Baltimore from Fort McHenry to Light street on the west. Here the great terminals of the Baltimore and Ohio, the Pennsylvania and the Western Maryland railroads have ample room for expansion. Here the Municipal Railroad, now being built by the city down Key Highway, will touch the deep water of Spring Gardens along McComas street; and here the great terminals of the future, great wharves and piers and docks for trans-Atlantic and coastwise shipping must find their natural location.

Here with the extended pier-lines and a new high and beautiful permanent bridge connecting South Baltimore at Hanover street with Baltimore county and the shores of Anne Arundel is the place which will give ample opportunity for the commercial and port extension of the city without limit.

And well may we prepare for it. The freight differential in favor of Baltimore as against Boston, Philadelphia and New York and other Atlantic seaports; the absence of port charges in our harbor as against port charges of something like a dollar a ton in New York; our proximity to the Panama Canal, being 1400 miles nearer the canal than San Francisco is and due north from the canal—each and all must in the nature of things bring its result eventually, unless we lie supinely down on our advantages and fritter our opportunities away.

It should not be our policy to construct terminal piers. The experience of Boston should show us that there is absolutely no direct return in revenue from the construction of piers. Railroads will demand them free if we construct them. But I believe the proper policy to be to own or control the water front; to see that sufficient water is in the channels of the harbor to adequately take care of the shipping; and to so administer this as a part of the public domain that it shall not get into the hands and under the absolute control of railroads or other corporations to the detriment of the municipality.

The piers already constructed are, to say the least, of very doubtful investment value, and it is practically certain that Broadway Pier will never make a return on its cost. It should not be our policy, in my judgment, to extend this form of harbor investment.

The completion of the Key Highway, however, across the peninsula and down the water front on the south shore along our projected McComas street, with our municipal railroad operating upon it, will be an admirable addition to our harbor and shipping facilities.

Baltimore, in common with other great American municipalities, has gone far in the stimulation of its park facilities. The 9 per cent. tax on street railways produce a large fund which goes exclusively now into our parks. The time is coming, if not already here, when a part of this fund should be used not exclusively for park development, but for the relief of the general taxpayer in the reduction of the tax rate. The increase should be used for this purpose.

Our park system, however, I regard as the finest in this country. We are now spending \$756,000 a year on our 2288 acres of park land.

I believe we should go no further in extending our park system. Indeed the automobile has rendered the big parks like Druid Hill and Clifton parks of secondary value. The necessity is for a small—from ten to fifty acres—breathing spot. Great parks like Druid Hill and Clifton, and perhaps Patterson Park, rather act as a deterrent and buffer to city extensions and growth.

The plan we are installing in Baltimore is that of connecting by broad boulevards the various parks surrounding our city.

Our underground conduit system is one of the most profitable of our municipal investments. It pays a good return on its total cost; and the relief that we get from overhead wires and poles is a net gain. It is being extended daily at a rapid rate in advance of our improved paving program. In 1913, for example, we laid upwards of a million and a half feet of conduits, which cost upwards of \$500,000, including manholes, contributing boxes and cables. This is the greatest amount of work ever done in one year, and we will exceed it in 1914.

So far as I have been able to learn and observe, our "White Way" system is the finest in the world, and we are extending it greatly this year—Baltimore street to Broadway and down Broadway to the new Broadway Pier, the Falls-way and Mount Royal avenue to Maryland avenue, Light street and down the Key Highway, Baltimore street west to Fremont, Gay street to Aisquith will make a white way illumination unequalled in the world. It is too brilliant for a residential neighborhood and interferes with the sleep of the residents, but turns night into day, at a very inconsiderable cost when we consider its advantages.

Our school system is a most excellent one. Our elementary and primary schools are the equal of anything in the country; above all it is a "Baltimore System," reflecting the best traditions of our people, and not under the control or copied from any other system, or under the control of any book trust or any other educational domination.

Our beautiful new Polytechnic school with a capacity of 2000 boys, availed of now by 1400 boys, which cost us a million dollars, with opportunity for future extensions, has just been opened. This, with the post-graduate course in technical training offered by our great Johns Hopkins University, gives an opportunity for a polytechnical education, the equal of anything in the country.

Our public schools generally are availed of by 90,000 children, and it is upon the excellence chiefly of our elementary and grade schools and teachers that the character of our future citizens largely depends. We appropriate for our public schools \$2,000,000 annually.

Our Playgrounds Association, to which liberal appropriations are made,

and the extension of our Municipal Dance Hall, which we are starting on a more extensive scale than heretofore, offers clean sport and diversion to our young people under trained teachers and chaperons, free from many of the contaminating influences often surrounding these forms of amusement.

Fort McHenry, occupying an important central and commanding position in the midst of our city, has been recently turned over by the Federal Government to the city to be used as a city park. This I hope to have used as a popular water-side park for democratic and popular diversions. It will, I hope, be taken advantage of by our rowing clubs, used as bathing beaches and for baseball and playground facilities under municipal control. There are thirty-eight acres of ground admirably located for these purposes.

It is at Fort McHenry that will be mainly staged the scene of our "Star-Spangled Banner" celebration, which will take place from September 6-13 of this year, and which will be participated in by President Wilson, ex-President Taft and ex-President Roosevelt. Patriotic, municipal and fraternal parades and pageants will be presented in an elaborate program. It was here that the "Star-Spangled Banner" was composed by the immortal Key. It was here that the attack of the British fleet on Baltimore was repulsed. It was here that the events took place that had so much to do with the maintenance of permanent peace with English-speaking nations. It was here that peace and prosperity to our country was assured; for three months after the repulse of the British from Fort McHenry and North Point, and it was on account of these victories, the Treaty of Ghent was agreed to.

I am inviting the people of the North, South, East and West to join with us in this celebration in rejoicing at peace and prosperity begun a hundred years ago at Baltimore, and to witness the rebuilding and reconstruction of a new city from an old one.

Baltimore is operating under a charter adopted by the Legislature in the year 1898. That instrument was drawn and prepared by a Charter Commission consisting of the foremost minds of our community. Since that time, however, other forms of municipal government have been adopted with varying success. In some cases a single representative chamber replaces the dual chamber; in some cases the representative chambers have been entirely abolished, putting the government in the hands of a commission; in other cases a single manager is put in charge of the municipality, and this manager employed, not elected.

All this with varying success, depending on the character of the people, the progress that they have made in the science of government and local conditions. In some places the single chamber is successful; in some places the commission form of government is unsuccessful. The fact is, in my judgment, municipal government is an evolution, and in America is still in an experimental state. In almost all cities graft and corruption have been eliminated, and in no place is this more conspicuous than in Baltimore. Our civic and municipal life is pure; the public money is wisely and economically expended, though we make no pretense to a non-partisan government and though operating under one of the older forms of charter.

The recently issued bulletin of the Federal Census Department shows that the overhead and administrative charges of the municipality of Baltimore are the lowest of all cities of the first class in the United States; that is, cities of over 500,000 population, thus showing the economy of administration of affairs in Baltimore city, and showing also, I believe, the efficiency and honesty of our city government.

The cities in the first class with which Baltimore is compared are as follows:

	Total per capita expenditures,*	General government,	Police,	Fire,	Protection of property, etc.,	Health,	Sanitation,	Highways,	Charities, etc.,	Schools,	Libraries,	Miscellaneous,	Public service enterprises,	Interest,	Outlays.
New York.....	50.64	2.34	2.97	1.73	0.67	0.57	1.97	1.93	2.14	6.86	0.23	2.17	1.55	8.15	16.36
Chicago.....	29.55	2.81	2.92	1.45	0.37	0.24	1.62	1.22	1.18	4.53	0.14	1.97	1.59	1.73	7.79
Philadelphia.....	26.97	2.48	2.69	0.91	0.44	0.33	1.28	2.62	1.88	3.88	0.13	1.33	1.76	2.62	4.62
St. Louis.....	30.31	2.04	2.54	1.53	0.29	0.19	1.78	2.40	1.08	4.67	0.23	0.55	1.68	1.50	9.23
Boston.....	48.47	3.02	3.19	2.26	0.47	0.81	2.61	2.93	2.34	6.89	0.56	2.96	1.92	8.40	10.12
Cleveland.....	31.08	2.23	1.50	1.36	0.20	0.48	1.36	1.80	0.84	4.88	0.48	0.95	1.21	3.23	10.54
Baltimore.....	31.76	1.76	2.21	1.62	0.18	0.34	1.54	1.89	1.18	3.41	0.15	0.86	1.26	4.24	11.12
Pittsburgh.....	41.47	3.14	2.07	1.87	0.69	0.58	1.41	2.96	1.54	6.35	0.60	1.33	1.81	4.45	12.69
Detroit.....	27.48	1.82	2.01	1.77	0.15	0.31	1.37	3.46	1.12	4.17	0.20	1.25	0.62	1.13	8.30
Buffalo.....	31.58	2.29	2.20	2.40	0.38	0.72	1.15	3.91	1.49	4.90	0.29	1.31	1.68	2.51	6.36
San Francisco.....	43.34	3.54	3.43	3.60	0.56	0.23	1.22	2.06	1.97	4.28	0.16	1.44	0.01	1.97	18.97
Milwaukee.....	28.92	1.97	1.54	1.71	0.34	0.39	2.39	2.55	1.33	4.69	0.22	1.21	0.79	1.26	5.55
Cincinnati.....	38.52	2.03	2.15	2.07	0.25	0.26	1.47	2.85	1.47	5.40	0.36	1.23	1.41	6.25	10.19
Los Angeles.....	61.42	3.61	1.73	1.24	0.82	0.25	0.92	2.68	0.98	6.56	0.31	0.96	0.93	3.43	37.02
Newark.....	37.79	2.49	2.51	1.73	0.28	0.72	1.46	1.82	2.02	6.65	0.35	1.18	0.97	4.42	11.17
New Orleans.....	25.32	1.92	1.12	1.44	0.24	0.39	2.08	1.50	0.54	3.18	0.10	0.37	1.58	5.23	5.71
Washington.....	37.69	1.91	3.06	1.91	0.94	0.40	1.90	3.67	3.31	6.60	0.21	1.51	1.70	1.07	9.50
Minneapolis.....	34.58	1.94	1.25	1.64	0.29	0.28	1.03	2.52	0.58	5.73	0.35	1.32	0.89	2.41	14.35

*The total per capita expenditures of the first 9 cities (having a population of over 500,000) were \$39.41, and the total per capita of the second 9 cities (having a population of from 300,000 to 500,000) were \$37.47. The total per capita expenditures of cities in the United States having a population of over 30,000 were \$33.23. It will be observed that the per capita expenditures of Baltimore, \$31.76, are less than the average per capita expenditures of all cities having a population of over 500,000, of those having a population of from 300,000 to 500,000, as well as the average per capita expenditures of all the cities of the United States having a population of over 30,000.

(Compiled by Department of Legislative References, City Hall, Baltimore, Md., June 23, 1914, from United States Census Bulletin 118.)

The fact is that the man makes the government, and if the people make a wise selection in their office-holders the political complexion is unimportant. Efficiency and cleanliness should be the watchword, and this can be had under any form of government, just as corruption and inefficiency may obtain under the commission form, a manager or a despotism.

"Of forms of government let fools contest,
What e're is best administered is best,
Of forms of creed let graceless zealots fight,
He can't be wrong, whose life is in the right."

A Thirty-Five-Million-Dollar Sewerage System

Regarded As the Most Scientific in the World, Under Construction

At a cost of \$23,000,000 to the city, Baltimore is constructing a sanitary sewerage and storm water drainage system, and it is costing the citizens approximately \$12,500,000 in addition for house connections with sewers. It is the first time in the history of the world that a city of over half a million people has built an entirely new modern plant of this character.

Until 1905, a year after the fire, Baltimore had no municipal sewerage system. A Sewerage Commission was then given charge of the problem of creating de novo a double system of separate storm and sanitary sewers that would entirely cover the city. Calvin W. Hendrick of New York, an eminent engineer, then in charge of the reconstruction of the sewers of New York, made necessary by the building of the subway, was chosen chief engineer of the Commission, whose membership was made up of well-known citizens of Baltimore.

An expenditure of \$20,000,000 is involved in the sewerage system under construction. This sum covers the cost of the Fallway viaduct and the covering of Jones Falls; a modern sewage-disposal plant, built on the accepted German principles; a gigantic 29-foot drain and outfall sewer, and so complete a storm water and sanitary sewerage system that an estimated \$3,000,000 additional will be sufficient to wholly sewer the entire city of Baltimore and provide the best sewerage system any city owns.

Some of the salient points in this development, one of the cardinal features of Baltimore's remarkable readjustment to modern civic requirements, are elucidated in an article prepared by Mr. Calvin W. Hendrick, Chief Engineer Sewerage Commission, for this issue as follows:

By Calvin W. Hendrick, Member A. S. C. E., Chief Engineer of Sewerage Commission

Years ago, when Baltimore was a comparatively small place, the method adopted of disposing of the sewage was by means of cesspools. They served in a satisfactory manner on account of steep grades and the underlying sandy strata of the city. As the city grew the question of adopting other means was raised from time to time, covering a period of probably 50 years. It was not until 1897 that any concerted action was taken, by the appointment of a Commission composed of Messrs. Mendes Cohen, F. H. Hambleton and E. L. Bartlett, who made an extensive and interesting report on the subject. Nothing, however, came of this report until 1904, when the Maryland Legislature enacted laws forbidding the discharge of sewage into the Chesapeake Bay or its tributaries without first purifying it, with a view to protecting the vast oyster fisheries of the Chesapeake.

The city of Baltimore, which had grown to a population of nearly 700,000 inhabitants without a sewerage system, depending on the old methods of disposing of her sewage by means of cesspools and otherwise, was thus brought face to face with one of the most stupendous engineering projects of modern times, i. e., the installation of two complete and separate drainage systems, one for storm water and the other for sanitary sewage.

The enactment forbidding the discharge of crude sewage into the Ches-

apeake Bay also authorized the city of Baltimore to issue bonds in the sum of \$10,000,000 to carry out the work of sewerage the city. This bond issue was approved by the citizens at the succeeding municipal election, and in June 1905, Mayor E. Clay Timanus appointed a commission of well-known citizens composed of Gen. Peter Leary, Jr., Mr. Charles England, Mr. Morris Whitridge,

Dr. Ira Remsen, Mr. J. Edward Mohler and Mr. William D. Platt, to carry out the work, with the Mayor a member of the Commission ex-officio. In November, 1905, the Commission gave me the honor of selection as chief engineer, I being at that time in charge of the reconstruction of the sewers of New York in connection with the construction of the subways.

On January 1, 1906, the staff of the chief engineer was organized and active field work begun on January 15. Actual construction was begun October 27, 1906.

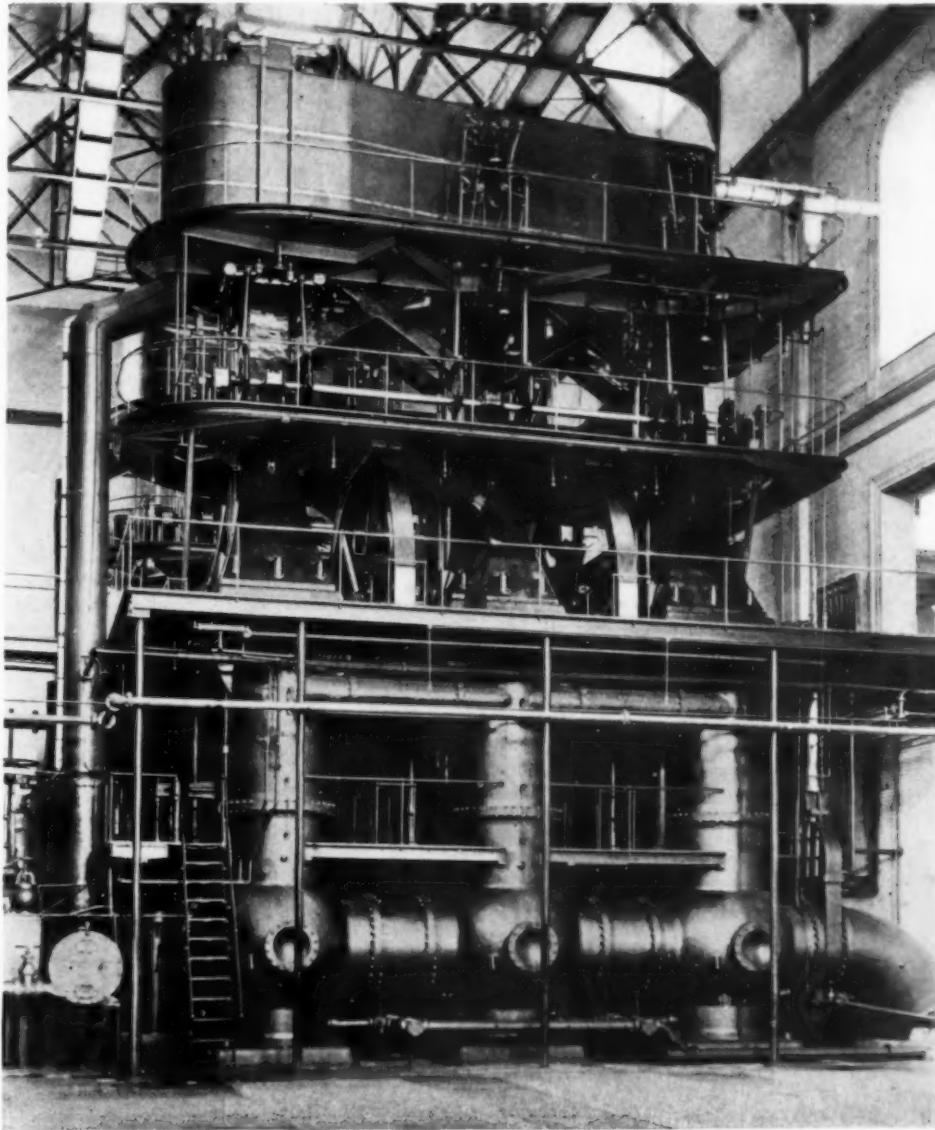
The original loan of \$10,000,000 was authorized and passed before the present Sewerage Commission came into existence. It was entirely inadequate to completely sewer the city and purify the sewage, and early in the existence of the present Commission an estimate of the time and cost of constructing a system to take care of the entire built-up portion of the city was made. This estimate was approximately \$18,500,000 for a complete sanitary system and a system of storm-water drains, and \$1,500,000 to enclose Jones Falls. The voters of the city promptly ratified this loan by the largest majority ever given a loan.

At the present time over 500 miles of sewers and drains have been installed, ranging in size from 6-inch house connections to 29-foot drains and outfall sewers, through which 16 automobiles, carrying the Governor, the Mayor, the City Council, the Sewerage Commission and a party of financiers made an inspection trip under the city.

The method of letting contracts in sections large enough to attract big contractors from all over the country, but not too large to shut out the smaller contractor, together with extensive advertising in both local and out-of-town papers, has resulted in excellent competition for the work.

On account of the requirement of the Legislative Act, that all sewage must be purified before discharging into the bay or its tributaries, it became necessary to keep the storm-water separate from the sanitary sewage, allowing the former to discharge through its own system of drains into the nearest natural outlet; otherwise, it would be necessary to purify and pump, at great expense, not only the sanitary sewage, but all of the rain water that finds its way to the sewers. This, manifestly, would require larger sewers, purification and pumping plants and greater expenditure than a city could reasonably afford.

Two-thirds of the sanitary sewage of the city will flow by gravity to the disposal plant on Back River, distant about six miles from the eastern city limits. The other third will require to be pumped through huge iron force-mains a distance of one mile to the outfall sewer, a height of 72 feet (including friction), from which point it also will flow by gravity to the disposal plant. The pumping station, designed to house five pumps, is now completed, and three of the 27,500,000-gallon per day pumping engines are now in operation. The foundation on which these pumps rest have been so constructed, independent of the foundations for the building, as to absorb practically all shocks.



ONE OF THREE SEWAGE PUMPS, EACH HAVING CAPACITY OF 27,500,000 GALLONS PER DAY

Outlays.
15 16.36
20 7.73
62 4.62
50 9.23
40 10.12
23 10.54
24 11.12
45 12.69
13 8.20
51 6.36
97 18.87
26 5.55
25 10.19
43 37.02
42 11.17
23 5.71
07 9.50
41 14.35

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It is impossible to realize the magnitude of the work or the diversified engineering problems that are being solved every day unless one takes the time to visit some of the construction work being carried on in various parts of the city. The work is most interesting on account of its complications. To convey a slight idea of its magnitude and difficulties, let us bear in mind that water must flow down hill. This means that an eight-inch sewer, beginning at a point in the extreme northwestern section of the city, 13 miles distant from the disposal plant, must continue on a constantly falling grade, which cannot be flattened beyond certain rates, ever increasing in size as sewers lead into it from hills and valleys covering an area of 32 square miles, crossing in its path numerous streams, ravines, three railroad tunnels, swinging around hills, tunneling through ridges, passing through narrow alleys, by the side of tall buildings, ever continuing on the constant falling grade, ever increasing in size until, on reaching the disposal plant, it is large enough to contain two automobiles, one on top of the other. The difficulties of the work are doubled on account of having to construct two systems of sewers and drains, which cross and recross each other in a thousand different places. In some cases two large sewers of the different systems come together on the same level. This necessitates the siphoning of one beneath the other, and in one case this has necessitated the construction of one of the largest siphons in the world. This siphon carries a storm-water drain nine feet in diameter under the sanitary outfall sewer, 12 feet in diameter. A siphon of this character must be designed in such a way as to care for not only the trickling summer flow passing through the storm-water drain, but also for runoffs from storms of great intensity. This was accomplished by designing a siphon along such unique lines as to cause comment in the engineering world. The siphon consists of a battery of three pipes and two dams. The dry weather flow will keep the smallest pipe under pressure at all times. A rainfall overtaxing the small pipe will cause the water to rise and flow over a dam, discharging into a second, larger pipe, putting it under pressure. In the case of a cloudburst or a storm overtaxing the capacity of both of these pipes, the surplus water flows over a second dam, putting the third, larger pipe under pressure. As the storm recedes each pipe is put out of commission in the reverse order until the small pipe only is left under pressure. This siphon has been in operation for about three years with most satisfactory results.

To attempt to install two separate systems of sewers and drains in the beds of streets of a city over a hundred years old, in which a mass of pipes have been laid, but in which practically no space has been left for sewers and drains, brings us face to face with a serious problem, as these sewers and drains must be constructed on regular calculated grades and cannot twist over and under obstructions like water pipes, gas pipes and other public structures. If the laying of the sewers could be confined to the streets the work would be greatly simplified, but wherever practicable they are being laid in the alleys, which are very narrow.

The Sewerage Commission extends the sewer connections to the inside of the property or building line, either front or rear, thus reducing the expense of connecting with the system to the property owners.

The Sewerage Commission,

since the beginning of the work, has maintained its own laboratory and testing plant, and every carload of cement is tested before being allowed to enter into the work, with the result that the character of construction is of the very best. The Commission is now testing all cement used by the various city departments.

In discussing the sewerage and drainage problem, the public little realize

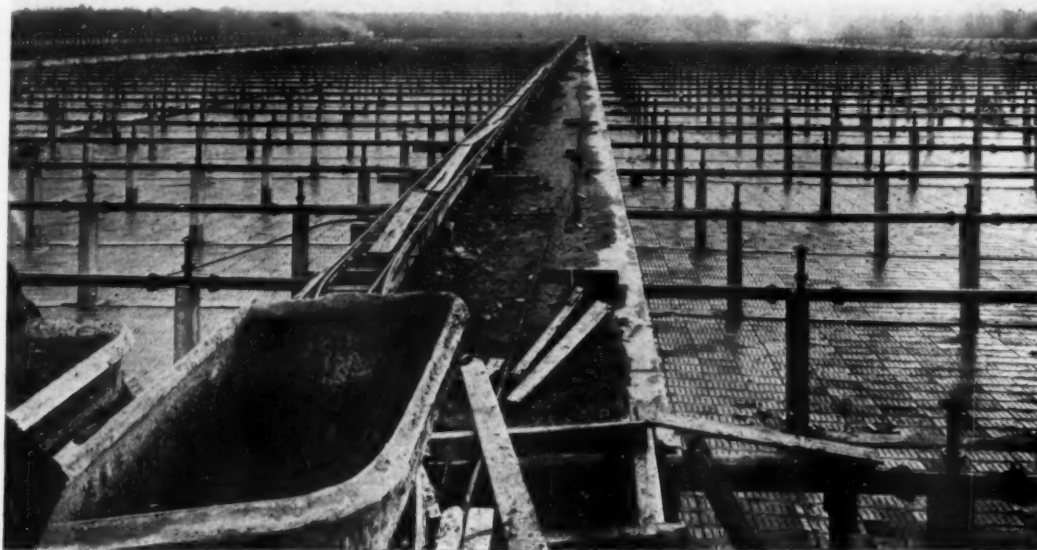
what an important factor in the life of the city is the introduction of the storm-water drains. This is brought out under four heads: 1. Making possible the laying of improved paving, by intercepting the surface drainage at intersections, thereby eliminating the thousands of cross-gutters, and the old-fashioned stepping-stones heretofore existing in the city, where the water flowed so deep in the streets that one could not cross without them. 2. The eliminating of Jones Falls, raising the tax value on an enormous amount of property in the center of the city and eliminating one of the greatest nuis-

ances and eyesores the city ever had to endure, and creating a new street. 3. Placing on a taxable basis hundreds of acres of vacant land that was impossible of improvement on account of surface drainage conditions. 4. The extensive relief to the city by preventing flooding at numerous points.

For the past hundred years the problem of what to do with Jones Falls was discussed by those interested in the progress of Baltimore. These discussions finally culminated in the building of retaining walls, about 1868, along the falls through the heart of the city, at a cost of about \$2,000,000. At the time this was considered a very growth of the city, however, charge of a great amount of sewage it a foul open sewer and breeding maintenance of the numerous stream had been a constant expense, lower section of the city around extensive lawsuits. The recom authorities to prevent the flooding raise the entire low area around in some cases up to the second a cost of about \$2,500,000.

The above were the conditions

and recommendations when the present Sewerage Commission undertook the sewerage and draining of the city. In the chief engineer's report to the



A SECTION OF BACK RIVER DISPOSAL WORKS



SEWAGE PUMPING PLANT IN WHICH BIG ENGINES ARE HOUSED



SECTION OF FALLSWAY OVER JONES FALLS



JONES FALLS AS AN OPEN SEWER BEFORE BEING COVERED

Commission for the year 1906, he recommended that this problem be solved in three recommendations, as follows:

1. That an intercepting drain be constructed in the bed of Harrison street, emptying into the harbor at the foot of Market Place, and cutting off all the drainage connections to the falls from this low area.
2. The enclosing of the falls in reinforced concrete conduits.
3. The building of a roadway over the top of the conduits.

Mayor Preston, in his then capacity as a private citizen, promptly visited me, with the statement that he wished to aid in seeing this carried through, and asking how he could aid in accomplishing it. I suggested that he get the public interested, resulting in his forming the Jones Falls Improvement Association, and at considerable expense to himself aroused public interest, and has been behind the project ever since. It was only after he became Mayor of the city that we were able to get it under actual construction. Too much credit cannot be given to Mayor Preston for securing this vast improvement through the eliminating of Jones Falls from the city map and creating a new north-and-south highway.

The above recommendations have all been carried out, with the exception of that part of the roadway which is carried over the Northern Central Railway tracks by a viaduct, which will be completed and thrown open to traffic the early part of September.

The falls have been enclosed for \$1,400,000, against \$2,000,000 for the retaining walls, and the Harrison street diversion drain has been built for \$130,000, relieving the flooding, against the recommendation of \$2,500,000 for filling in the area.

The enclosing of the falls has eliminated 12 bridges and redeemed 428,000 square feet of land in the heart of the city, and makes possible the elimination of two more railroad bridges and the redemption of 175,000 square feet of additional land, and has given to the city a broad north-and-south street from Mt. Royal avenue to Baltimore street and Market Place, that portion thrown open to traffic being already congested.

As the viaduct to carry the roadway over the Northern Central tracks and connect up with Mt. Royal avenue and the present grades of Eager and Chase streets was to be constructed out of a different loan from the sewerage loan, I was employed as the consulting engineer by the Board of Estimates to design and supervise the construction of this viaduct in line with the plans I had studied out and recommended. This viaduct is now drawing towards completion, at a cost of about \$225,000, and will be one of the most used streets in the city of Baltimore, as well as an ornamental structure covering what was formerly an open sewer.

The sewage-disposal plant is constructed on the unit system, in order that it may be added to as the sewerage system is gradually extended.

The method of treating the sewage at the disposal plant is as follows:

At the mouth of the outfall sewer are installed screens that catch such things as sticks, rags, etc., which are removed and burned. The sewage then passes through the meter-house, which measures its flow; then through



TWO AUTOMOBILES MEETING IN THE BIG OUTFALL SEWER, ONE FROM HIGH LEVEL SEWER SECTION, OTHER FROM LOW LEVEL SEWER SECTION

a large portion of which would be wasted if the sprays were stationary. These nozzles throw a square spray, thereby saving additional space which would be lost if the sprays were circular, as where circles touch there is a lost triangle.

The spraying of the sewage through the air is essential to the aeration and purification of the sewage. As the sewage falls on the beds it trickles down through 8½ feet of broken stone, varying in size from 1 inch to 2½ inches. The passing of the sewage through these beds forms a gelatin-like film on the stones, in which certain bacteria multiply by the million, attacking and killing the injurious bacteria in the sewage. We therefore make the bacteria do the work for us by fighting each other. The sewage on reaching the bottom of these stone beds is practically pure, and is then carried by intercepting channels leading to a central channel under the stone beds, which finally delivers the purified sewage to the settling basins, requiring three hours to pass through the latter. These settling basins are not for the purpose of causing additional purification, but to clarify the fluid, as there are certain mineral substances in the sewage which the bacteria do not annihilate, such as is found in the water of the Mississippi River, which is muddy but not injurious to drink. The sewage then passes with a drop of 18 feet through the powerhouse, in which are placed turbines operated by the flow of the sewage. These in turn run dynamos which generate electricity, giving power to light the plant and run the pumps.

Thus by the gravity flow of the purified sewage, power is obtained to light and operate the plant at practically no cost.

Since the Sewerage Commission's original estimate in 1907, three things have transpired:

1. The bonds have been sold at a discount of nearly \$1,500,000, reducing to that extent the amount asked for.

2. Sections that were then woods and cornfields are now streets lined with buildings.

3. The maintenance cost of the system has been taken out of the funds estimated for construction.

In order to complete the work in accordance with the original estimate of the Commission and sewer the additional built-up territory, the Commission have, through the Mayor, asked for an additional three million dollars, which will entirely complete the work and turn over to the city one of the most up-to-date sewerage and drainage systems in the world.

Up to the present time the work of the Commission is within their original estimate both as to cost and time.



SECTION OF FALLSWAY VIADUCT COMPLETED

Over \$10,000,000 Expended for Parks

Without Costing Taxpayers One Dollar



ONE ENTRANCE TO DRUID HILL PARK

THE prodigality of nature and the thriftiness of man have combined to bless Baltimore with a system of parks unsurpassed in beauty and unapproached in resources for upkeep. The natural state of all this section is and always has been full of the greatest grandeur, so much so that the traveler finds in the country homes and large estates surrounding Baltimore on every hand a reminder of the superlative charm of the finest country estates of Old England. Indeed, some who have been afoot through the rarest parts of rural England, and gained thereby such an intimate acquaintance with the country as no other mode of travel gives opportunity for, have declared that in extent, variety and profusion of loveliness the country around Baltimore, in whichever direction and how far one may go, is not surpassed in England or any place at all. Between lofty hills, ranging from gentle slopes to bold and rugged heights becoming almost mountainous, there nestle the valleys of many restless little rivers, coursing their way to the Chesapeake, and everywhere, whether hill or dale, until the woodman comes, there is a wilderness of forest growth, gigantic oaks, lindens, beeches, poplars and elms, and trees of many other kinds, including patches of evergreen hemlock, spruce and pine.

The original Baltimore was founded on the Patapsco River, an arm of the bay, at a point only about a dozen miles from the bay itself, where several valleys come together, and it has grown and is growing now by spreading inland on the ridges and plateaus and up the intervening valleys. There had been indeed a wealth of parks in Baltimore which would have filled the world with its fame had earlier attention been given to the preservation of the noble estates that bordered on the village of that day. The glory of Belvedere, well wooded and stretching from Pratt street to Charles-street bridge and from Eutaw place to the lower course of Jones Falls, comes to the generations of today as a

haunting wraith of regret that so little of that lordly estate was spared by the leveler, the street maker and the layer of mortar and brick. This princely domain of Col. John Eager Howard, on which he built a palatial home, and a portion of which he opened to the public as a recreation ground and meeting place, served as the city's park for fifty years, and then, in other hands, was despoiled of its forest, checkerboarded by streets and covered by houses in rows. Only the open squares of Mt. Vernon place, surrounding the imposing monument of Washington, which ground was donated to the city by Colonel Howard, remain to remind the sojourner of today that here was a spot whose wondrous beauty as well as historic worth entitled it to be preserved. Here was where May-day picnics and Fourth of July celebrations were held; here is where Lafayette was lavishly entertained and feted when he made his return visit to the United States; here is where imposing memorial services were held to Adams and Jefferson, and here was the scene of every sort of public demonstration until well towards the middle of the century last passed.

It was not until 1860 that a pronounced public appreciation of the value of ample park lands began to manifest itself, although a tract of 37 acres, the nucleus of the Patterson Park of today, had been donated to the city in 1827, and ten or a dozen small squares or parks had been acquired by purchase or by gift. In 1860, through the public-spirited course of Mayor Thomas Swann and eleven associates, who took equal portions of \$120,000 worth of the city bonds, thereby moving the owner, Lloyd N. Rogers, to accept bonds for the remaining half of the purchase price, the magnificent Rogers estate of some 660 acres, known then as Druid Hill and subsequently as Druid Hill Park, came into the possession of the city and marked the beginning of the Baltimore park system, now comprising some 2500 acres and being extended on well-defined plans.

To the genius and public spirit of Mayor Swann is ascribed not only the honor of having secured for Baltimore the majestically beautiful Druid Hill Park, but of devising the plan by which through a payment by the street railway company of a part of its gross earnings all parks and parkways are to be secured and maintained for all time, with not one cent of ultimate cost

to the taxpayers. In 1859 the first street-railroad company in Baltimore was given a franchise, with a provision that 20 per cent. of its gross receipts were to be paid to the city, and this fund was to be applied to the exclusive purpose of park lands and maintenance. A park commission had selected Druid Hill as the most desirable park site available, and bonds had been issued on the strength of the street-railroad charter provision. The first payment by the company, in 1860, amounted to \$32,902.14, and with slight variations the amount has steadily and greatly increased—notwithstanding the reduction by agreement from 20 per cent. to 12 per cent. gross in 1874

and 9 per cent. in 1882, the fare being reduced from 6 to 5 cents—until a total of \$10,913,502.21 has been paid by the city to the park fund. Estimates for 1914 are \$600,000. The street-railroad company has been reorganized a number of times, but there will apparently be no interference with the constantly increasing revenues for the parks. The company's charter is perpetual, and the tax



A MUNICIPAL OUTDOOR SWIMMING POOL SAID TO BE THE LARGEST IN THE COUNTRY



A MUNICIPAL PLAYGROUND MAINTAINED BY CITY

is thus good for all time. Up to the present time nearly \$4,000,000 has been expended in the purchase of property for park purposes. Much of this has been secured by loans or bond issues, which will be taken care of by a sinking fund which comes out of the moneys received from the street railways.

A Board of Park Commissioners has been in active charge of the park

Gwynns Falls for park and driveway purposes. Wyman Park, forming a connection between Druid Hill Park and the University Parkway, and including a long stretch of rugged woodland along the valley of Stony Run, was purchased in 1903. The acreage of the Wyman Park purchase totals 198. The next important purchase, in accordance with the suggestion of the Olmsted



A BEAUTIFUL LAKE IN DRUID HILL PARK

system of Baltimore since its organization under Mayor Swann. It has been composed of public-spirited citizens who give their time to the work without remuneration, the only salaries being those paid to the secretary and assistants.

The most important purchase made by the Park Commission after Druid Hill Park was acquired was that of the fine old colonial estate of Charles Carroll, called the "Barrister" to distinguish him from Carroll of Carrollton. It was a tract of about 177 acres remaining from the old thousand-acre plantation, and included the colonial mansion of the original owner. This tract has been very greatly beautified and is one of the most ornamental and useful parks in the city. Here, as elsewhere in the public parks, children's playgrounds and gymnasium and athletic fields have been laid out, and the park serves the many purposes of amusement and recreation which the public expects of a large city park.

In 1892, through an understanding with Col. Richard M. Venable, president of the Board of Park Commissioners, and Mr. Theodore Marburg, president of the Municipal Art Society of Baltimore, the Olmsted Brothers, the well-known landscape architects of Boston, were employed to make a comprehensive examination and report on a plan for the development of public grounds in Baltimore. Accordingly the work was done and a very elaborate plan was reported by Olmsted Brothers, outlining suggestions to be followed in the development of a well-defined park plan. The report suggested the purchase of various large tracts of land in different parts of the city and also connecting strips and boulevards. The plan was adopted, and the Commission has been working along the lines suggested since that time.

In accordance with these suggestions, Clifton Park, 267 acres in extent, the old home of Johns Hopkins, was purchased in 1895. The magnificent grove of old oaks, the mansion-house and the extensive greenhouses were included in the purchase. The beauty of the grounds was enhanced by the construction of a large lake as a water-supply reservoir.

The next extensive purchase was a tract of 390 acres in the valley of



TREE LINED WINDING ROADS EXTEND FOR MILES



A VIEW ON EUTAW PLACE LEADING TO DRUID HILL PARK

report, was a tract in the north-eastern section along Herring Run, a purchase having been made of 165 acres in 1908.

Other purchases by the Commission since it came into office include smaller tracts, among them being one of 60 acres in the northern section of the city, which has been given the name of Venable Park. Altogether there are now fifty pieces of property held by the Commission, ranging in size from the 700 acres of Druid Hill Park

down to squares in the business section of the city of less than an acre in extent. The plan outlined by the Olmsted report is being followed as closely as changing conditions will justify. In the main it will be a guide for all future development of Baltimore's park system. When completed, there will be a well-defined network of large parks, parkways and connecting boulevards, covering all sections of Baltimore and leading into the well-kept country estates far beyond the borders of Baltimore.

As in every city where a park system has been developed, the influence on surrounding property is of a very beneficent character. The city improves the approaches to the parks, and the owners of property on streets facing the parks either themselves provide appropriate improvements in the main, or taking advantage of enhanced values, part with their holdings to purchasers of means and taste, who build in harmony with the beauty of their surroundings, thus adding to the general effectiveness and charming aspect of the situation.

With the completion of the 33d-street boulevard, which will probably be finished this year, and the construction of the Gwynn's Falls Parkway, now in process of condemnation, it will be possible to drive from the southeastern water front of Baltimore at Patterson Park to the southwestern water front of Baltimore at Gwynn's Falls Park, completely encircling the city, without once leaving city and park property, either by park boulevards 120 feet wide or through sylvan parks, all a part of Baltimore's park system. No city will have a more artistic or more picturesque system of parks, and in the end it will have been acquired without burdening the taxpayers with any portion of the cost.



SPLENDID ROADS THROUGH VIRGIN FORESTS ABOUND IN BALTIMORE PARKS

All Baltimore's Wires Go Underground

BALTIMORE is the first city to install a complete municipally-owned electrical conduit system, and probably the first in the world to operate a wireless telegraph system connecting with a repair motor truck. For its conduit system loans or bond issues aggregating \$5,000,000 have been secured, and the system, now rapidly covering the entire city, will ultimately banish all overhead wires from this municipality. So rapidly do people adjust themselves to improved conditions, no matter how revolutionizing they may be, that undoubtedly few Baltimoreans are able to realize how cluttered-up the streets were with poles and wires only a few years ago. The accompanying illustrations will remind the reader how much brighter is the world we live in now, since the sunlight and air have been let into our streets and alleys by the removal of the obstructing poles and wires.

It was in 1898 that the city of Baltimore began the construction of its own subway system for the reception of wires and cables operating all classes of electrical service used in the city. Prior to that time other municipalities were building their own conduits for the accommodation of wires used solely for municipal purposes. Baltimore had likewise some few years previous built some sections of conduits to be used for police and fire-alarm telegraph service. But no city had ever entered upon the construction of conduits to be used by all companies and individuals operating electrical wires.

The city of Baltimore realized that it would have some difficulty in securing the removal of all overhead wires by the various wire-using companies, and it concluded the most satisfactory solution of the problem would be to construct its own conduit system and establish a commission with authority to compel all overhead wires to be removed and placed under ground in its conduits. The requisite State legislation was secured in 1892, authorizing the Mayor and City Council of Baltimore to provide conduits and to require all telegraph, telephone, electric-light or other wires to be removed from the streets and placed in the conduits, to prescribe rentals for the use of space therein, and providing for the appointment of an Electrical Commission for the city.

An Electrical Commission was then duly appointed for the purpose of investigating the conditions surrounding the problem. After mature deliberation upon the subject this commission made its recommendations as to the plan of construction, the schedule of rentals to be adopted, and the appointment of a permanent commission. It was not until the latter part of 1897, however, that the necessary funds were provided to actively engage upon the undertaking. In that year the voters of the city, by a vast majority, approved an ordinance to issue \$1,000,000 in bonds to permit the subway system to be begun.

Then was started an enterprise which required in its minutest details the most careful and cautious management, as, being of a nature more or less experimental, the eyes of not only its taxpayers were turned upon it, but the great public-service corporations were closely watching, ready to criticize if it should appear that the scheme was not feasible. And, furthermore, it was essential to have the co-operation of the various wire-using concerns in order to secure the proper data as to the extent of their lines and their probable future requirements, so that the system might be constructed intelligently and with sufficient foresight to accommodate the fast-growing consumption of electrical energy.

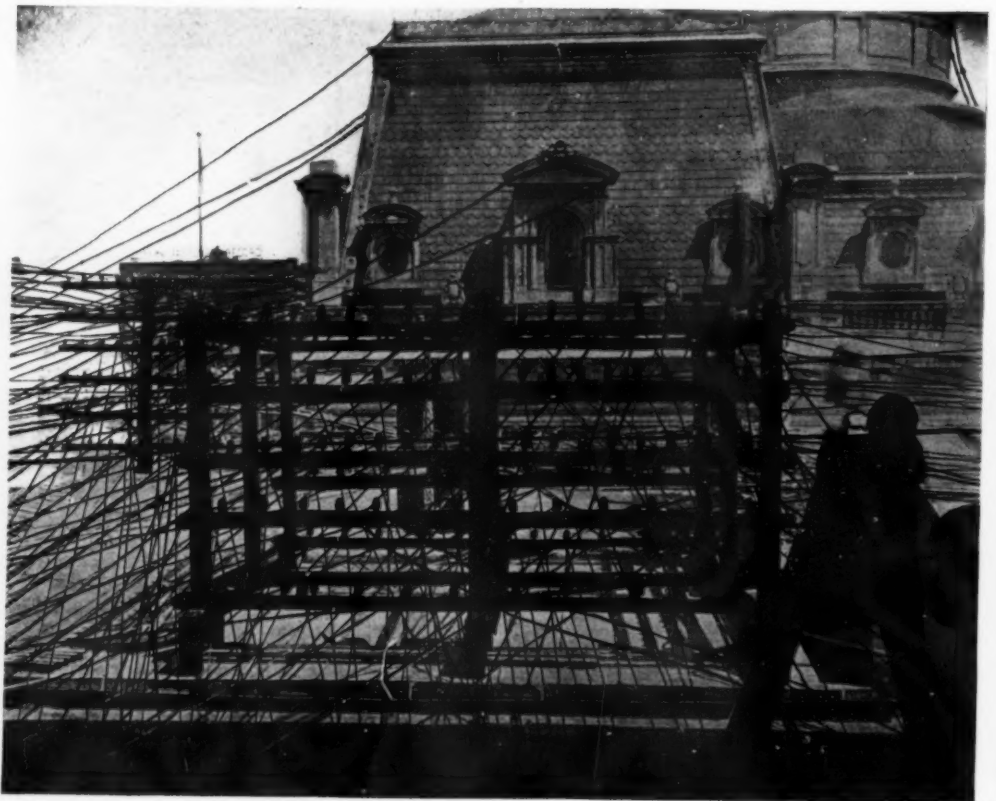
It was soon realized by those who were compelled to place their wires in the conduits that their property was made more secure, with quicker and safer access, and that their maintenance charges were thereby greatly diminished; and hence their thorough co-operation was very early given. And, too, as soon as the system began to acquire definite form and the downtown streets were rapidly being cleared of overhead wires and ugly wooden poles, and it was manifest that the work was no longer in the experimental stage, inquiries as to the details of construction, the schedule of rentals, etc., began pouring in to the Electrical Commission from cities and towns in all sections of the country, and even from foreign municipalities.

There have been laid more than 13,000,000 duct feet of conduit, which thor-

oughly covers all downtown sections and those districts where individual consumption of electrical service is greatest, and the work of building extensions to the more remote parts of the city is still progressing. It has, of



BALTIMORE AND SOUTH STREETS BEFORE WIRES WERE PUT UNDER GROUND



A CORNER OF THE CITY HALL COVERED WITH NETWORK OF WIRES UNDER OLD SYSTEM

course, been necessary, in order to avoid again tearing up the streets and duplicating the conduit lines, to make ample provisions for increased demands for duct space by installing a number of ducts greater than is actually required at the present time. Moreover, in connection with the vast amount of street paving of the most modern and approved type now being laid, Mayor Preston has very commendably ruled that no city department or public-service corporation whose business it is to maintain pipes or other structures beneath the surface of the street, will be permitted to disturb the new paving for five years

from the time the paving is laid. Hence the Electrical Commission has in each instance of new street paving hastened to install conduits where it apprehended they will be necessary at some future time in order to make the subway system comprehensive and adequate when the construction is finally completed. However, in many of these cases the conduits so installed are not in streets contiguous to the system as it now exists, and are not, therefore, available at the present time for occupancy. Cables for all classes of current now

to spare in its conduits which had been constructed for municipal cables, was renting a small amount of duct space at the rate of 3 cents per foot per annum, while in another city, where the conduits were built and operated by a company incorporated for that purpose, a yearly charge of 20 cents per foot was being made to lessees. The primary purpose of the city of Baltimore in taking in its own hands the matter of maintaining a system of conduits being to procure the removal of overhead wires under uniform conditions,

operative alike upon all concerns, in order to provide greater safety and an improved appearance of the streets, and not to establish a commercial enterprise for gain, it was therefore desired to fix a rental charge that was equitable to both the prospective tenants and to the city itself. After a thorough consideration of this feature a scale of rental was adopted whereby the annual charges range from 7 cents per duct foot to the smallest user of space, to 5 cents per duct foot where more than 100,000 duct feet are occupied.

The revenue derived from this source is increasing yearly, that during 1913 amounting to \$120,800.46. There has to date been collected in rentals the total sum of \$969,985.47.

In order to carry on the work four loans have been made, the first three of \$1,000,000 each, and the last, passed in the fall of 1912, being for \$2,000,000, of which about \$750,000 has been expended. The bonds, or city "stock," issued for the first two \$1,000,000 loans bear interest at the rate of 3½ per cent. and run for 25 years, maturing in 1922 and 1928, respectively. The third and fourth loans cover 50-year periods, falling due in 1958 and 1962, respectively, and bear 4 per cent. interest.

All cable installation and repairs are done under the supervision of the city's inspectors. An emergency crew is also maintained, and these men make daily trips of inspection to see that the conduit lines and the manholes are kept in good condition. For this purpose a motor truck is used, which carries a centrifugal pump capable of exhausting water from manholes at the rate of 12,000 gallons per hour.

A thoroughly modern feature is used in connection with this truck, and that is a wireless telegraph equipment, by means of which the chief inspector can from his office communicate instructions to his men on the truck, no matter in what part of the city it happens to be. The truck serves as a receiving station only. The antenna is suspended immediately under the roof of the car and is made of approximately 425 feet of No. 14 stranded rubber-insulated copper wire laced back and forth so that 40 wires are obtained with a separation of one inch. The aerial is therefore inconspicuous and well protected.

A series of rigid tests proved conclusively that the scheme is entirely practical and that excellent results can be obtained through the aid of a simple code of signals, making it unnecessary to resort to the employment of trained operators. It was also demonstrated that a direct earth connection was unnecessary, inasmuch as the iron framework of the chassis serves admirably as a counterpoise ground, thereby enabling the truck to receive while in motion. During all the preliminary tests the truck never failed to intercept any message sent to it within a radius of ten miles of the sending station, and even under the most unfavorable conditions, with the truck running at full speed and blanketed by tall buildings of steel construction, no difficulty was experienced in reading the messages.

The idea, originated and put into execution by the present chief cable inspector, is entirely novel, and has been exciting widespread interest. Those who have investigated the scheme and have found that it works so admirably, predict its general use in the near future on commercial trucks, and even on pleasure cars.

Efficiency has marked the operations of the Electrical Commission, and Baltimore is now largely free from the unsightly and dangerous overhead street wires. This means no more interruption with city telephone or lighting service on

account of storm-swept or snow-laden wires and prostrate poles, and in the congested business portions of the city the menace to the lives of firemen, which is ever present in a network of electrical wires, winter or summer, is eliminated.

In districts where the use of electric current is not general, and the cost of installing independent house-service connections would be prohibitive, trunk conduits are laid and a lateral spur is run up the alleys to the base of a distributing pole, from which service is then carried overhead to the buildings.



THE SAME CORNER FREE FROM WIRES. NOTE THE DIFFERENCE



THE CITY HALL SKYLINE FREE FROM WIRES UNDER THE NEW SYSTEM

occupy about 3,000,000 duct feet of the system, the electric light and power company and the street-railway company being the largest tenants. Each of these companies has in the ducts feeders of a potential as high as 13,000 volts.

When the problems incident to the construction of the system were being considered by the commission appointed for that purpose, by no means one of the easiest of their tasks was the prescribing of a schedule of rental charges for duct space. They had no precedent by which to be guided. An investigation on their part developed that one city in this country having some space

Baltimore's \$50,000,000 Light and Power Company

Aggressively Aiding in City's Industrial Development

BALTIMORE was the first city in the United States to use illuminating gas, and since the day gas was first turned on, in 1817, the flow has never for a moment been shut off. Even during the great fire of 1904 operations were continued at full headway, the company deciding to keep the service up, cutting off connections with houses in the burned district as soon as they could be reached, instead of trying to stop the waste by shutting down the plant, to the incalculable inconvenience of the city at large.

Gas was first used in London in 1812, so that it was from London that Baltimore took the cue. At the present time there are more than a thousand foreign stockholders in the Consolidated Gas, Electric Light & Power Co. of Baltimore, principally in London and other parts of England. The stock is a good dividend-payer, so the offspring is dutifully discharging an obligation to a parent.

These are spectacular features in the story of the beginning and the present-day status

of an institution which early heralded the enterprise of Baltimore, and which now, a \$50,000,000 corporation, thoroughly modernized and equipped to furnish gas, electric light and power, not only continues to be an advertisement of Baltimore's up-to-dateness, but has with allied interests so aggressively entered into many lines of development work as to become a leading factor in the city's growth. It is impossible, for instance, to calculate the potentialities for industrial expansion contained in the hydro-electric development on the Susquehanna, forty miles from Baltimore, of an ultimate 120,000-horse-power capacity plant, eight of the ten units of which are in operation now, delivering power to Baltimore for the street railway and numerous industries and serving with lights and power an area of 270 square miles, of which Baltimore is the focal point.

In every form of its activities the Consolidated Gas, Electric Light & Power Co. of Baltimore is keyed up to the highest degree of efficiency, and throughout it is operated on the principle that the best interests of the company are served by giving the best possible service to the public, and that the company can itself greatly prosper in no better and surer way than through the greatest possible prosperity of the community in which it operates. All energies are therefore bent towards fostering a well-rounded industrial development here and in making of Baltimore a most attractive place to live and do business.

The greater development of the company dates from the consolidation of the various constituent companies in 1906. With the advent of the present management new features were introduced in both divisions of the company's business, gas and electric lighting and power. Large sums of money were expended in betterments of all descriptions, and an international market was created for the company's shares by sales to a thousand or so of English

investors. The stock is listed on the exchanges of London and Bristol, which not only gives stability and a ready market to the shares, but advertises Baltimore by creating a widespread interest in the city among a most substantial lot of people abroad. Baltimore and its institutions are discussed in detail, in the light of all the information possible to obtain, and whenever a stockholder happens to come this way he always stops off at Baltimore to look over the properties and see the town. It is the rule that the Englishman is very much impressed

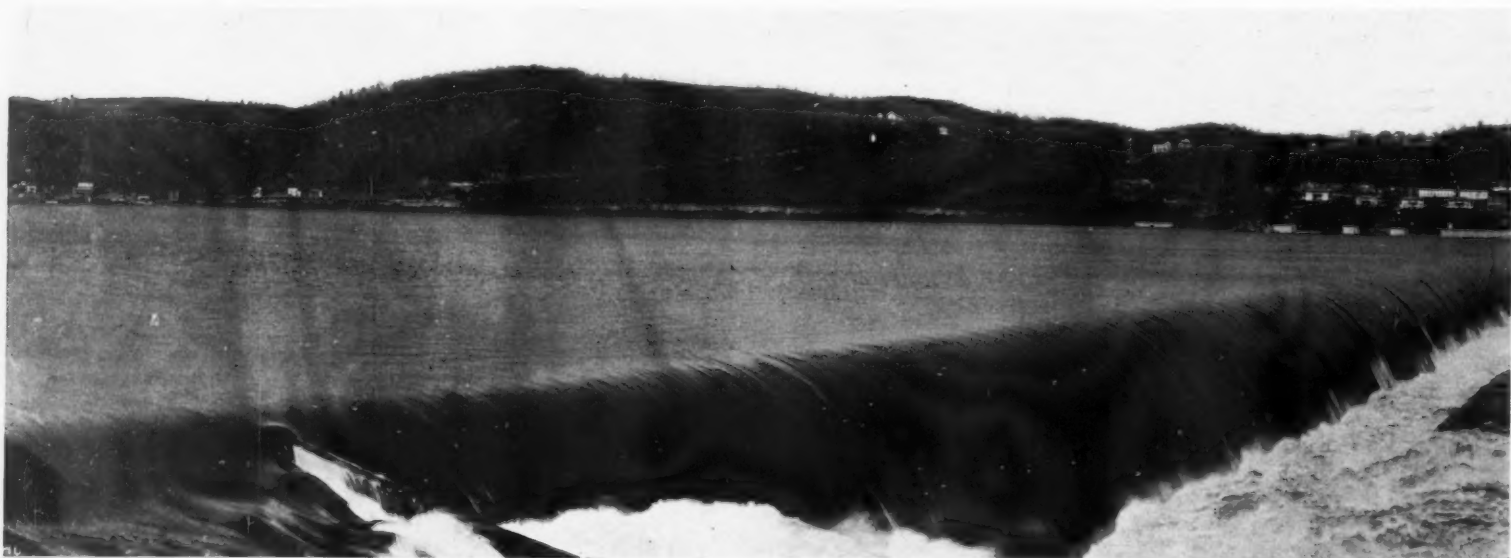
with Baltimore. He likes the English traits of solidity and reserve which he finds in the Baltimore people, and is pleased with the parks and boulevards, the suburban homes and country estates. He also approvingly notes the lack of tenements and the ownership of homes by the working people, which gives them a stake in the community and works for good order and the well-being of the State.

While the Pennsylvania Power Co. is entirely separate and distinct as an organization from the Consolidated Gas, Electric Light & Power Co., Mr. J. E. Aldred is president of both companies, and it was chiefly to supply Baltimore with electrical power that the development on the Susquehanna at Holtwood was carried out. The dam is almost the longest in the world, being exceeded only by the Assuan dam in the Nile and the Mississippi River dam at Keokuk. It was completed and power turned on about four years ago. Since then several units have been added, the eighth having just been finished. This gives a total present development of 110,000 horse-power, 100,000 of which will be available for Baltimore as required. Late developments provide for a second transmission line of forty miles length, from Holtwood to Baltimore.

The Consolidated Gas, Electric Light & Power Co. controls all the gas and electric business in Baltimore. Before making contract with the Pennsylvania company electric power was generated at the company's steam plant at West-



CONSOLIDATED COMPANY'S GAS MANUFACTURING PLANT AT SPRING GARDENS



DAM AND POWER-HOUSE ON THE SUSQUEHANNA RIVER AT HOLTWOOD, PA., WITH ULTIMATE CAPACITY OF 110,000 H. P.

port, on the west bank of the Middle Branch of the Patapsco River. This Westport plant has a rated capacity of 32,000 horse-power. The company also has a 7500-horse-power plant on Gould street and a small water-power plant at Ilchester. The Pennsylvania company also sells power to the United Railways Co., which has its own steam plant of 52,500 rated horse-power, which is operated in an auxiliary way during the peak load hours. The Pennsylvania company has a contract calling for the services of both the Railways and Consolidated companies' entire facilities in case of failure to the power plant through accident, but the Consolidated plant has not been called on so far. Nevertheless, with an increase in the electric business of the company amounting to about 60 per cent. since the contract with the Pennsylvania company was made, the Consolidated has felt it to be the part of prudence to enlarge its Westport plant to the point where it would be able to fully take care of its business in case of a breakdown of the Pennsylvania's plant. It has, therefore, installed a new turbo-generator of 20,000 horse-power, the largest size of horizontal generator in operation anywhere at this time, and has greatly increased the boiler capacity, so that the generating capacity of the Westport station will be 47,300 horse-power.

In carrying out this extension it was necessary to build a new smokestack, and in its construction a unique feature was introduced. For reasons of economy and efficiency it was decided to put the stack on stilts, as it were, starting it on top of the roof, at an elevation of 65 feet above the ground, instead of building it on a piece of ground in the immediate vicinity of the power-house, as is usually done. The stack is built of tile brick and has a height of 280 feet above the ground, or 215 from the top of the roof. Its support is a number of 72-inch steel girders, resting on eight columns, set on large concrete foundations, heavily reinforced with grillage beams and reinforcing bars. The size of the center foundation, which supports the four main columns, is 35x40 feet and 8 feet deep, laid on top of 198 piles driven to an average depth of 25 feet. In addition to the load of 1224 tons, which is the weight of the stack, the superstructure has to carry two service water tanks of 25,000 gallons capacity each, and loads due to roof, coal bunkers, boilers, floors, etc. Another problem to be worked out was lateral bracing to protect the stack from the enormous horizontal wind pressure to which it is subjected.

With the advent of the new company all the best features of modern man-

agement and salesmanship were introduced in all divisions. A commercial department was organized, whose function is to get new business, and through its operations the number of gas consumers has risen from 63,575 to nearly 120,000, with an even greater increase in percentage of gas consumed. The consumption now amounts to about 4,000,000,000 cubic feet a year, which is double that of nine years ago. So much gas is now used in the arts and

industries that the consumption in the daytime exceeds the amount used at night, while in spite of the increased use of electric lights, there has been an increase in the night consumption as well. "Going after business" in an organized way has greatly extended the use of gas in the household, for the kitchen range, the water heater and the smoothing-irons in the laundry, and it has also been widely adopted in school, club and hotel kitchens, in public laundries, and for such purposes as operating refrigerating plants, firing boilers and general steam-making; heating furnaces for welding, hardening, annealing and case-hardening of steel; in wagon shops, especially for tire setting; for heating paint cauldrons, etc.

In the early days of the gas company's history a large and advantageously located plot of ground, covering 57 acres, or several city squares, fronting on the Middle Branch of the Patapsco River and extending back toward Hanover street, the location being known as Spring Gardens, was purchased for the location of the gas plant. Recent improvements here include the construction of an enormous gasholder with capacity of 6,000,000 cubic feet, space enough to take in a couple of the biggest skyscrapers of Baltimore. Every device and method known for the economical manufacture and distribution of high-grade gas has been installed here until the operation of the plant has been re-

duced to an exact science. The works have a generating capacity of 18,000,000 cubic feet a day. As the company also takes gas from the by-product coke plant of the Maryland Steel Co. at Sparrows Point, which is piped through a 12-mile 20-inch main, under a contract calling for 4,000,000 cubic feet daily, it will be seen that the present capacity of the plant provides for a great expansion over the 11,000,000 feet average of daily consumption today. There is a total holder capacity of 14,000,000 cubic feet, there being holders at Canton, Bayard street and Catonsville stations, in addition to those at Spring Gardens.

Nearly 700 miles of mains serve a territory of 100 square miles, of which Baltimore constitutes 31 square miles. The company's gas and electric operations extend throughout the city and into Baltimore, Howard and Anne Arundel



CHEAP POWER AND IDEAL CONDITIONS ARE FEATURES OF BALTIMORE'S INDUSTRIAL BUILDING



OF THE PENNSYLVANIA WATER & POWER CO. FOR SUPPLYING LIGHT AND POWER TO BALTIMORE, 40 MILES DISTANT

counties. The operation of the gas and electrical divisions are kept entirely distinct, even as to executive offices. Each has a demonstration window and showroom in a separate building, containing an attractively arranged display of articles and processes, and each also has a smaller display and salesroom in the shopping districts, as a matter of convenience and education to the passer-by. One is called the Industrial Gas building and the other the House Electric. Here are attractive exhibits and demonstrations of the many ways in which gas and electricity may be used, in the household and in the shop and factory. Also, therefore, branch stores and offices in several suburban towns.

Each division has large repair shops and warehouses with amazing activities and capacity. Motor vehicles have so largely taken the place of the horse-drawn wagon that the company now has but 60 horses in service, while the number of motor vehicles foots up 116. Delivery wagons, service wagons and a motor car for the delivery of mail to the various shops, stores and departments are among the motor vehicles used, and there is also an emergency car, or ambulance, fitted with first-aid appliances, including a pulmotor. To keep track of the various vehicles owned by the company the position of traffic manager was created, which indicates the organization's perfection of detail. Another interesting feature of the organization is the company's newly-created training school, carried on by the operating department's gas division. The schoolroom covers a floor area of about 3700 square feet, in the main building of the distribution department on Front street. The chief instructor is Louis W. Herbst, who was chosen from the ranks of employees on account of his long service and broad knowledge of practical work. The first step taken has been to outline a course of instruction for employees engaged in various lines of fitting work. This covers the installation of gas appliances of every description, of meters, lamps and house piping, the handling of complaints about service, and all the various operations which enter into fitting work. Every employee engaged in fitting work is required to take the full course of instruction, without regard to his position or length of service, with a view to the co-ordination of operations. The time required for the course depends in each individual case on the progress made. All periods of instruction are held during the day time, the company paying the employee's salary while engaged in the school work. While there are demonstrations in the schoolroom of various conditions of defective pipe work, graphically showing with glass piping the causes of trouble encountered in actual practice; a skeleton model of a house to demonstrate the proper methods of installing house piping; exhibits showing the right and the wrong way to install lamps and fixtures; demonstrations of the manner in which gas appliances should be repaired and adjusted and new meters should be installed and how they are read; how to adjust hotel and industrial appliances, field work or work done in actual practice is also a part of the school training. The school of instruction will cover all branches of the work, so that both the public and the company will have the benefit of skilled mechanics. The all important subject of safety is one of the subjects receiving careful attention at the school.

The result of all these efforts is a better understanding between the gas company and the public, and it follows that the efforts of canvassers for new business are more prolific of success, the knowledge being spread that the

company is anxious to please. In households special efforts are made to increase the use of gas ranges and water heaters. One of the best ranges on the market is made by a Baltimore manufacturer, who was encouraged and assisted by President Aldred some years ago, and to help local industry the gas company carries these ranges in stock. The sales of ranges now run about

10,000 a year, the number now in use in Baltimore footing up about 100,000. Gas water heaters are sold at the rate of about 3000 a year, the number in use here today being something more than 23,000.

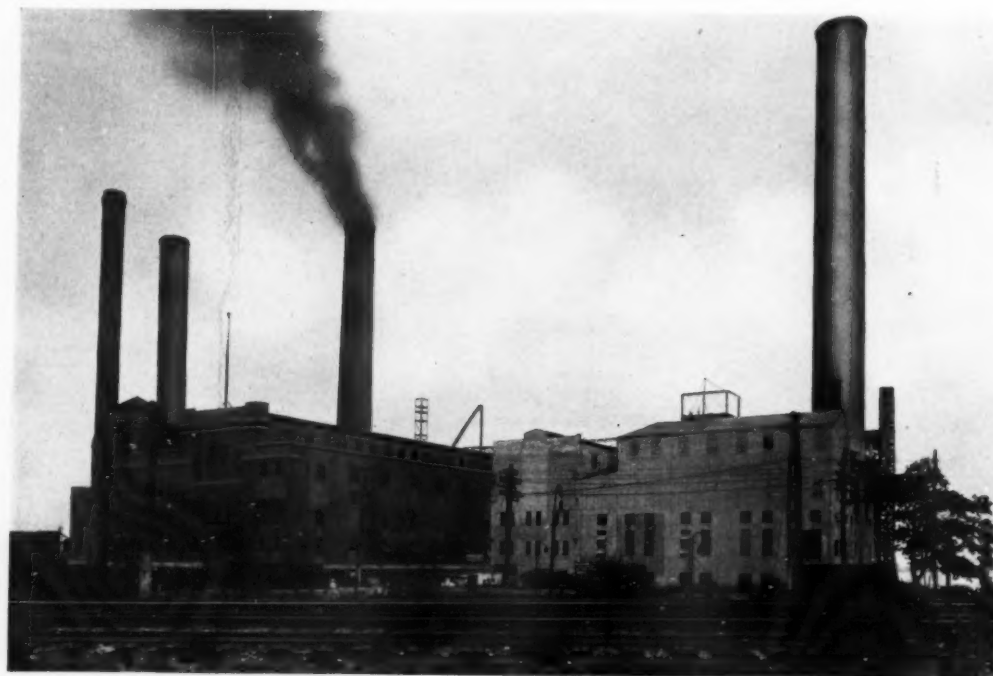
While there is a persistent and successful campaign on all the time to push the use of electricity for domestic purposes, the field for its extended use in the industries is so much vaster that here is where the most notable and the most interesting development has occurred, and here is the direction in which the broad conceptions and active efforts of Mr. Aldred and his organization are of enormous advantage in the industrial development of Baltimore. The Consolidated company carries on this

campaign with the very helpful suggestions and personal assistance of Mr. Aldred. In addition to furnishing big units of power to industries already here, such as the railways, the Maryland Steel Company, etc., the work of the organization is responsible for the location here of the Baltimore Gas Appliance & Manufacturing Co. and the Baltimore Tube Co., as well as the Industrial Building, sometimes called the Beehive, and has been at work for a year on an industrial survey of Baltimore. The first-named company was organized by Mr. H. W. Hunter, who had come to Baltimore with the idea of starting a gas-range factory in a small way. The Consolidated company, believing the business would justify a more extensive plan, arranged to turn over to Mr. Hunter sufficient space in an abandoned factory building the company had acquired at Bayard and Hamburg streets. The enterprise has been successful from the beginning, and now, after a few years, the Oriole range is widely sold not only in Baltimore, but is shipped in great numbers at a considerable distance.

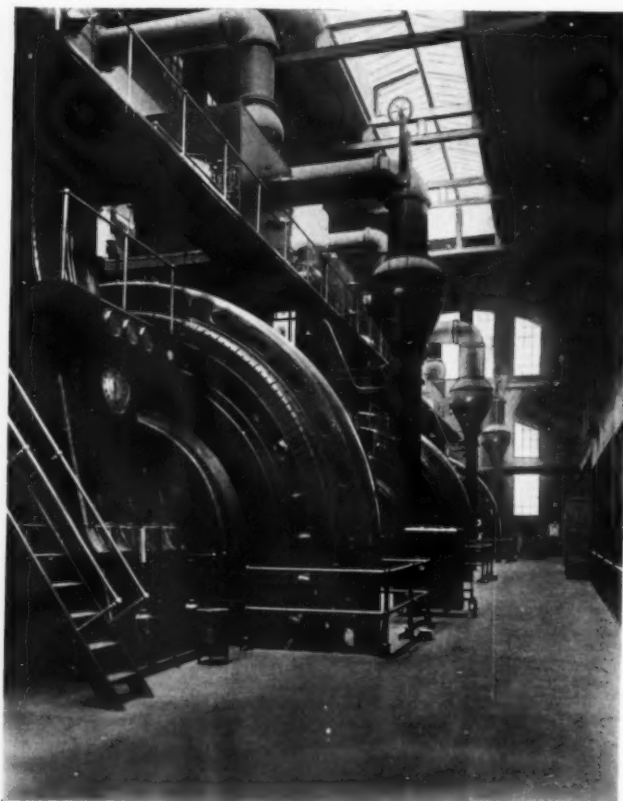
The Baltimore Tube Co., of which Mr. Herbert A. Wagner is president, is located upon property adjoining the works of the Baltimore Gas Appliance & Manufacturing Co., and comprises 6.05 acres. This property is owned by the company and has on it brick buildings of a substantial character with a floor area of 70,000 square feet. The outstanding capital of the company is \$1,360,000. The principal manufacture is of seamless brass and copper tubing made by the piercing process, and the capacity of the plant, based on average sizes of tubing, is approximately 300,000 pounds per month. This capacity is now being increased. The company also makes "Riflex" flexible metal tubing in one continuous solid piece of metal, which, being airtight, is a big improvement over the usual flexible tubing made up of strips of copper or other metal. The company is operated by men experienced in this particular class of manufacture, and the total number of employees engaged aggregates 250 men. For the

past several months it has been necessary to work night and day forces to keep up with orders. The plant is perhaps one of the most efficient, in that it is of the most modern type, in the country.

The Industrial Building was proposed by Mr. Aldred to specifically aid in the industrial development of Baltimore. His idea was that it would not only attract new industries from the outside, but would very greatly aid infant industries already here. He has always expressed great faith in the possibili-



WESTPORT POWER-HOUSE, SHOWING ADDITION IN COURSE OF CONSTRUCTION



VIEW OF PART OF TURBINE PLANT, WESTPORT POWER-HOUSE

ties of a large industrial development here, based on geographical location, proximity to raw materials, advantages as a distributing point, and, most important of all, the fact that Baltimore furnishes conditions of home life to working people unequalled in any other city in the country.

So the Industrial Building Co. was organized with \$300,000 capital stock, Mr. Alexander Harvey president, Mr. Wm. J. Chapman vice-president, Mr. Chas. M. Cohn secretary and treasurer. The Pennsylvania Water & Power Co. and the Consolidated company each subscribed for \$75,000 of the stock, and the other \$150,000 was taken by 184 different individuals. There were no promotion costs, every dollar raised going into the building. So a concrete structure with seven stories and a basement, 117.10 feet on Preston street by 152 on Clifton place, was erected, free of debt, with 55 per cent. of the wall space taken up with windows, and with a 37-foot court in the rear, midway between the wings, every corner in every part of the building is flooded with light and all conditions are sanitary. The stairways and elevators are in a fireproof inclosure, entirely cut off from the two wings with fireproof partitions and double fireproof doors. This and a complete equipment of sprinkler system enables tenants to get an insurance rate of 25 cents per \$100 in stock companies as against \$1.40 to \$2.60 elsewhere here, while factory mutual insurance companies give the extremely low rate of 10 cents per \$100.

The building was opened for inspection July 24, 1912, and was ready for tenants about the 1st of September. All sorts of industries took advantage of this opportunity to be housed without the expense of a plant investment, and attracted by the conditions that are conducive to the health, contentment and efficiency of workmen, within six months 82½ per cent. of the total rentable floor space had been taken, and within 15 months a dividend of 4 per cent. on \$300,000 was declared. It became necessary to add another unit, which was completed in the spring, and largely occupied as soon as anyone could move in. All told, there is a rentable floor space of about 192,000 square feet. The idea has taken so well that another plant by a separate organization has been built, and still others are likely to be added.

Power is furnished the tenants in the Industrial Building at a uniform rate, which at present is 2 6-10 per kilowatt hour. All the current used in the building is measured by a master meter, which establishes a wholesale rate for the building. Tenants have an individual meter and pay a proper proportion of the total bill. When the total consumption increases, the rate per tenant decreases, a reduction having been made during the past year from 3 2-10 cents to the present rate. The minimum rate to the largest users in Baltimore is 1½ cents, with 8½ cents maximum.

Tenants in the Industrial Building include half a dozen who never were in business before, and one firm, making ladies' dresses, which came here from Saratoga, N. Y. In the basement there is a manufacturer of gun carriages for the United States Government and other heavy machine work. Printers, engravers, makers of men's and women's clothing, etc., and even a laundry, are among other tenants here. There being no vibration and each room being entirely separated from all others, what his neighbor makes is immaterial to any tenant.

To further the development of Baltimore industries Mr. Aldred last year established an organization to make an industrial survey. Baltimore alone constitutes a vast market for manufactured articles. An expert study of conditions is being made to determine what manufactured articles consumed in large quantities in Baltimore can be advantageously manufactured here. Having reached such determination it will be the function of the industrial survey to promote industries for making such articles as would find a home market. It is considered inevitable that money will be forthcoming for an enterprise having the great advantage of a ready market, founded on sound conditions as to the cost of manufacture.

Research work of an exhaustive character has been carried out on these lines for about a year. A report will be ready before very long. It is believed this report will have a powerful effect in arousing people to the opportunities here for a vastly greater industrial development than anyone has yet conceived.

The Industrial Activities of Baltimore

MANUFACTURING in and around Baltimore represents an aggregate investment of at least \$270,000,000 and an annual output of nearly 150 different products to the value of \$352,000,000. The strong industrial position of the city thus epitomized is not always appreciated as it should be. For that two main factors are responsible.

In the first place, the city's manifest advantage of location for trade tended, in nearly a century after its founding in 1729, to retard the utilization in the mechanic arts of its manifold mineral and timber wealth, even had there not been in the first half of the period characteristic hamperings of colonial government. The inclination thus cultivated from the earliest days became greater as coastwise and inland trade expanded under the "clipper" regime into world-wide commerce and as that commerce, which made Baltimore's name known in all quarters of the globe, added power to financial interests and begot a habit of mind which persists to some extent today, in spite of the intimate influence wielded by diversified manufacturing activities upon the city's commerce and finance.

These two interests combined have a local capital less than one-half as much as that occupied in manufacturing, and they give employment to less than three-fifths as many persons. But, of their very nature, they occupy a much larger space daily in the public eye because the machinery of their far-reaching energies is housed in a comparatively restricted area. On the other hand, Baltimore's industries are segregated in no section, and, consequently, have no mass aspect emphasizing in any dramatic way their really imposing proportions.

These are revealed, however, in the study of a few comparative figures. In 1909, the latest year for which authoritative statistics are available, the whole South, with its area of 945,088 square miles and its population of 32,480,343, had \$2,883,929,000 capital invested in factories, not including hand trades and neighborhood industries, and those factories produced on 236 distinct lines to the value of \$3,158,379,000.

In 118 cities having each more than 10,000 inhabitants and an aggregate population of 5,781,708 was \$1,232,980,000 factory capital, or 42.8 per cent. of the total in the South, and the value of their factory products, \$1,495,988,000, was 47.4 per cent. of the Southern total.

Baltimore city, at the far northeastern corner of the South, had in its area

of thirty-one square miles a population of 558,485, or 9.7 per cent. of the population of the 118 Southern cities, but its factory capital was \$164,437,000, or 11.7 per cent., and the value of its factory products was \$186,970,000, or 12.5 per cent. of the totals in those cities. Its distinct lines of industry numbered 148 of the 236 Southern total.

These figures apply to Baltimore city alone. But, just as several thousand persons engaged during the day in the city make their homes in its environs, and therefore should be considered in any count of the citizenship of Baltimore, so many of the industrial operations carried on beyond its boundaries are more or less directed from the city or contribute to its growth. On that account, industrial Baltimore means something more than the city itself. That fact is recognized by the National Census Bureau in including Baltimore among the thirteen industrial or metropolitan districts, the others being New York, Chicago, Philadelphia, Pittsburgh, Boston, St. Louis, Cleveland, Buffalo, Detroit, Cincinnati, Minneapolis-St. Paul and San Francisco-Oakland, in which are situated most of the industries in intimate touch with the life of the central cities.

The Baltimore metropolitan district embraces the city itself and an area around it averaging ten miles beyond the corporate limits, in all 295 square miles. The accompanying table summarizes the leading facts in 1909 of the district, of which the city proper contained 84.8 per cent. of the population, 87.9 per cent. of persons engaged in manufacturing, and 82.3 per cent. of the capital in factories of the district. The population was 658,715, an increase of 12.7 per cent. in ten years; the persons engaged in manufacturing numbered 93,603, an increase of 15.2 per cent. in five years; the capital in factories

was \$199,735,181, an increase of 61.2 per cent. In ten years, and the value of factory products was \$260,213,324, an increase of 38.3 per cent. in the same period. If the rates of increase which prevailed between 1904 and 1909 were maintained in the past five years—and there is every reason to believe that such was the case—the metropolitan district of Baltimore, with a population close to 700,000, has now \$270,000,000 invested in manufacturing of all kinds, including hand trades and neighborhood industries, with an annual output valued at \$352,000,000.

One-third of a billion dollars of manufactured goods turned out in one year is a marked advance in the industrial life of the city. It is, though, more of

TEN YEARS' PROGRESS IN BALTIMORE MANUFACTURING INDUSTRIES.

	1909.	1904.	1899.
Population	658,715	*	577,670
Manufactures:			
Establishments	2,668	2,243	2,352
Persons engaged.....	94,954	81,235	*
Proprietors and firm members	2,790	2,506	*
Salaried	10,339	7,297	5,744
Wage-earners	81,825	71,432	71,688
Primary horse-power.....	125,080	105,063	*
Capital	\$199,735,181	\$166,770,882	\$122,000,527
Expenses	\$237,569,855	\$180,810,209	\$154,302,049
Services	\$48,585,334	\$36,648,368	\$32,298,174
Salaries	\$11,888,229	\$7,724,061	\$6,187,327
Wages	\$36,697,105	\$28,924,307	\$26,110,847
Materials	\$165,085,541	\$124,000,047	\$108,775,530
Miscellaneous	\$23,808,980	\$19,561,794	\$13,319,245
Value of products.....	\$260,213,324	\$202,659,272	\$176,909,124

*No figures available.

These figures are for the metropolitan district of Baltimore, including Baltimore city, the first, third, ninth, twelfth, thirteenth, fourteenth and fifteenth districts of Baltimore county, and the fifth district of Anne Arundel county, thus adding to the industries of Baltimore city those of Canton, Sparrows Point, Curtis Bay, Westport, Brooklyn, Dickeyville and other suburban points.

an advance than a change in the character of the community in recent years since recovery from the effects of the war in which Baltimore shared with the section so closely allied to it permitted a revival, with steadily accelerating momentum, of the city's energies. In the thirty years between 1880 and 1910 the amount of capital in manufacturing in Baltimore increased 327 per cent., while there was an increase of only 68 per cent. in the population.

There have been changes, of course. In 1870 Baltimore sugar refineries were producing to the value of several millions of dollars, and about them were a myriad of ship-chandleries, naval stores establishments and cooperages, and the inner harbor was alive with sailing vessels bringing the sugar from the West Indies and some Latin-American countries on the mainland of South America, and carrying back cargoes of Baltimore flour and other goods. In the next ten years the refining industry had declined to an annual output of less than \$900,000, and for a while the general industry of the city felt the effects. But already the annual output of men's clothing was valued at \$9,447,000, or more than the value of the sugar and molasses of 1870, and since then it has increased to \$36,269,000, one-half of the output in that line in the whole South. Tobacco manufacturing has had its fluctuations, but its importance in Baltimore is indicated in the recent building of a plant costing more than a million dollars to make decorated tin for tobacco boxes, the largest plant of its kind in the world.

This is the center of the tin-can industry of the country, which involves investments of some millions of dollars. Typical of many of the diversified lines of industry is the world's largest enterprise making bottle-stopping and sealing devices, representing an annual output running into millions and using a group of the largest factory buildings in Baltimore.

Importations of fruit at Baltimore today are worth much more than the raw sugar imported thirty years ago, and many a steamer enters its harbor with a tonnage five or six or more times as great as that of many members of the sugar fleet of the past.

With no diminution of the boundaries of the territory in which its manufactured goods are distributed, the character of the factory products thus distributed has changed in some respects. In the earlier days Baltimore marble was found in the interior decorations of the State Capitol at Columbia, S. C., and was used in completion of the Washington Monument at the national capital, and for monoliths in the Capitol building there. Baltimore-made bridges were flung across the Missouri River for the North Missouri Railroad and across the Mississippi for the Rock Island Railroad, and the Varrugas Viaduct, 12,000 feet above the sea in the heart of the Andes, was constructed by one Baltimore firm, while another made metal lighthouses for the Government and the columns for the dome of the National Capitol. A third firm made the name of Baltimore synonymous with bells in several continents, and a fourth sent its products all the way to Portland, Ore., by way of Cape Horn. This last-mentioned is quite typical of many others. Starting as a stove-founder, it enlarged into structural-iron work and architectural iron, and now has a world reputation as a manufacturer of immense gas holders. During the Civil War a Baltimore plant was occupied most of the time in making armor plates for the Government, and it made the armor for Ericsson's "Monitor," which marked the beginning of a revolution in naval architecture. Later another plant began to construct metal vessels for the Government, and in Baltimore waters was built the dry-dock for the Philippines, the largest in the world, about twelve years ago. This establishment has also had many other Government contracts besides those for the mercantile marine, and has shipped its steel rails to Asia, Africa, Australia, and even to England.

Modification in the character of distribution without a change in spirit has not been matched by change to any great extent in the methods of selecting sites for industries. Location of industries at Baltimore has generally been a matter of natural selection. That is why they are not congregated in any one area, although here and there are groups of special classes. Beds of iron ore underlie some parts of the harbor and some of the land upon which the city has grown. Men in active middle life can remember the caves left in digging this ore and the grappling from rowboats for nuggets at the mouth of the Basin.

Peter Cooper, the enterprising, left in 1828 with a burden of 3000 acres of land along the water-front of what is now the busy industrial and commercial hive of Canton, a virtual extension of the city toward the east, dug the ore on Lazaretto Point, turned nearby trees into charcoal, established his furnace and made the first Baltimore charcoal iron. Within a few years, in 1837, coke from bituminous coal was used in iron-making in Maryland, but the real era of coke iron was many years distant. As late as 1880 only 3,338,300 tons of coke were made in this country. As the Catalan forges passed, to be followed by a drift of the center of the iron industry toward the interior with the discovery of the Lake Superior ores, there was a halting in the rate of advance of the Baltimore iron interests. At the same time shipbuilding, which had flourished as an adjunct to commerce of the port, declined as steam took the place of sails. But with the establishment of a great iron and steel plant at Sparrows Point in 1887 came a revival, and the output of vessels of iron or steel was increased to a marked degree. Instead of Baltimore-made charcoal in iron-making of three-quarters of a century before, this plant was soon making its own coke from West Virginia coal, the by-product gas being sold for consumption in light and power in Baltimore, and using that coke in smelting ores brought from Cuba and Mediterranean ports.

Water-powers of Jones Falls and Gwynn's Falls entering the Baltimore territory from the upper part of the county were sought for grist mills and later for cotton factories, long and well known hominy mills having once stood near the spot where the Falls viaduct rises to the level of Mt. Royal avenue. The Belair, Hookstown and Frederick roads, along which the market wagons rolled and the cattle were driven to town were within the regions where tanneries, wool and hair works and slaughter-houses were established.

Deep interest in artificial fertilizing of the soil which began to develop in

the early part of the last century was responsible for Baltimore's being the city to make the first importations of Peruvian guano to this country, and it was a Baltimore sea captain who discovered and brought to the United States the phosphatic guano of the West Indies, and subsequently became a partner in one of the earliest fertilizer firms of the city. The fertilizer plants, depending at that time for much of their material upon foreign lands, were started near the water's edge, within gunshot of lands which less than fifty years ago were fertilized by the direct application of alewives seined in the Patapsco River, and near the water's edge the fertilizer factories are grouped today. So, too, it is with lumber, furniture factories, cooperage works, sash and door factories and other woodworking establishments, being not far removed from the lumber yards along the docks or near railroad terminals.

There is a nest of metal-working industries within the shadow of the City Hall dome, but others are at widely separated points, one of the oldest and most successful being at Woodberry, on the northern limits of the corporation. Woodberry's growth, indeed, was due to that establishment and the textile mills strung along the narrow stream for a mile or more, and it is interesting to recall that a pioneer of cotton manufacturing in that section and one of the original members of the iron firm were trained in industry at the same plant in Howard county. The first of these cotton mills was a conversion of a grist mill, and all of their raw material was for many years hauled by teams from the wharves into the country a distance of six or seven miles. Such difficulties, however, did not prevent them from transferring the center of the cotton-duck trade from New Jersey to Baltimore, or later from making only a memory of the old rope-walks near the Basin.

Acid works, potteries, glass works, chemical factories, limekilns and other industries dependent upon importations or material lying close at hand were placed to suit the convenience of their projectors, so that, with the exception probably of Canton, there was in the earlier days little assembling of different kinds of plants. But at Canton as early as 1873 there were 12 oyster and fruit packing houses, establishments which became quite a feature of other parts of the water-front; 8 coal-oil refineries, 7 brickyards, 6 breweries, 4 fertilizer factories, 3 lime burners, 3 iron smelters, 3 distilleries, 2 chemical works, 2 stove and hollow-ware foundries, 2 steam sawmills, a copper-smelting furnace, which has since become one of the greatest plants of its kind in the world, then using ore mined within a few miles of the city, but now handling material brought principally from the West, its output being partly reflected in the \$41,000,000 worth of copper exported annually from Baltimore; sugar refinery, stone-cutting yard, can factory, rolling mill, axe-handle factory, car-wheel foundry, sash and planing mill, white-lead works, packing-box factory, shipyard, cotton-bating factory, machine shop, agricultural implement works and furniture and wooden-ware factory, in all 68 establishments divided among 26 separate industries. Of later full growth are the establishments making clothing of various kinds, hats and caps, and placed near the jobbing and wholesale section of the city, showing a tendency toward a certain degree of segregation of allied industries within the limits of the city proper.

The machine shops of the Baltimore & Ohio Railroad have, since the days of Ross Winans and Peter Cooper working there to substitute in railroad transportation the steam locomotive for the string of horses or mules, expanded at Mt. Clare, while those of the Northern Central, after considerable life in the hollow now occupied by the Mt. Royal Station of the Baltimore & Ohio, were moved to the level under the eastern edge of Druid Hill Park, with a part later transferred to Bayview Junction at the east of the city.

This scattering of industries has had the effect of dispersing to many parts of the city the home-making wage-earners and others engaged, and it has been one of the means of minimizing the tendency in every large city toward congestion into narrow neighborhoods of any one element of the population. It has been responsible for the popularity of the two-story dwellings, either near the industrial plants or at distant points and the rather notable number of home-owners among the 250,000 persons dependent immediately upon manufacturing. This feature of the city's life, made possible by the ramified street-car system, is one of the strong elements in the development of its industries. Perhaps no other city of its size has as many home-owners among its wage-earners with equal advantages in an educational way and as to living expenses. Consequently there is comparatively little shifting of the productive population and little of the unreasoning unrest that besets managements of industries dealing with transient workers.

This fact adds to the advantages in easy access to sources of raw material and ample equipment for distribution of finished products which have attracted investments to Baltimore's industries and which must continue to attract even greater volumes.

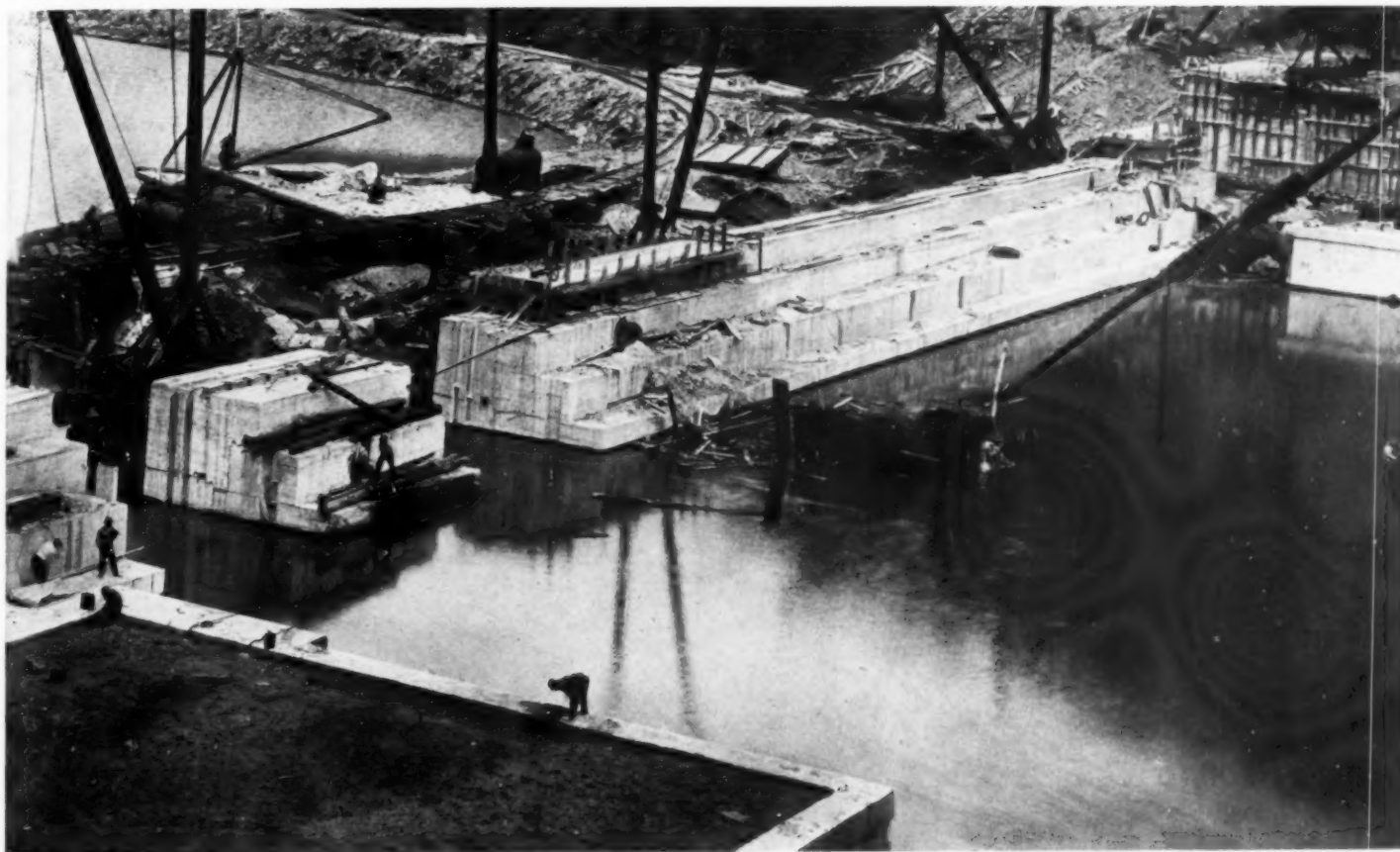
Another potent invitation is in the wide diversification of existing industries with capital well distributed among them. Some classes of factories have aggregate capitals of several millions of dollars, but the average for those within the city limits is about \$1,350,000. Typical classes in 1909 were, according to capital:

Copper, tin and sheet iron, \$20,654,713; men's clothing, \$19,283,106; foundry and machine shops, \$7,862,893; tobacco, \$6,442,026; printing and publishing, \$5,025,289; malt liquors, \$5,350,236; patent medicines, etc., \$4,056,157; canning and preserving, \$3,885,496; steam railroad shops, \$3,471,038; lumber products, \$2,852,931; slaughtering and meat packing, \$2,852,013; confectionery, \$2,700,836; bakery, etc., \$2,666,076; straw hats, \$2,607,298; shipbuilding, \$2,077,571; furniture, etc., \$1,824,983; women's clothing, \$1,685,753.

A few enormous industries have, in exceptional circumstances, made a manufacturing center. But the healthiest situation generally is that in which there are a large number of comparatively small industries dominated by none, but assuring a maximum of steady employment for most of the wage-earners, when dull times in the case of a few extensive industries might mean stagnation for the community. Baltimore is especially rich in maintaining a balance of great and small manufacturing enterprises.

Waterworks Extension to Cost \$5,000,000 Guaranteeing Abundant Supply of Filtered Water

By EZRA B. WHITMAN, Consulting Engineer.



NEW LOCH RAVEN DAM, INITIAL STORAGE CAPACITY 2,000,000,000 GALLONS; ULTIMATE CAPACITY 20,000,000,000 GALLONS

BALTIMORE is at the present time making extensive improvements to its water supply which will give the city one of the finest water supplies of any city in the world, both as to quantity and quality of the water. The supply is taken from the Gunpowder River, and the water is naturally soft and well adapted for both domestic and manufacturing purposes.

The old Loch Raven dam, however, is nothing more than a diversion dam, and in the dry periods of the summer time the stream flow becomes so low that it is not sufficient to supply the needs of the city. There are a number of storage reservoirs inside the city, which have heretofore supplied this deficiency, but these have become inadequate to meet the growing demand of the new Baltimore. Before proceeding with the work the advice of three of the foremost hydraulic engineers in the country was secured and extensive reports were made upon the best method of increasing the supply and also the best method of purifying the water so as to make it absolutely safe for drinking purposes and perfectly clear and pure for manufacturing purposes.

In order to increase the available supply it was decided to build an impounding reservoir in the valley of the Gunpowder River about one-half mile above the old Loch Raven dam and in the waters of the old dam. The old Loch Raven dam has a crest elevation of 171 feet above mean tide, while its present storage capacity is approximately 100,000,000 gallons. Plans were made to build the new dam to a crest elevation of 237½ feet above mean tide, which would give a storage capacity of 20,000,000,000 gallons of water. Owing to the fact, however, that there was not sufficient money available to build the dam to this height from the present five-million-dollar loan and complete all the other improvements which are now under way, and owing further to the fact that there was considerable difficulty encountered in securing the land which would be flooded by the high dam, it was decided to build a dam with a crest elevation of 192 feet.

This lower dam will have a capacity of 2,000,000,000 gallons of water, and it is estimated that this will be sufficient to supply the needs of the city for ten or fifteen years in the future. The construction of this dam is now practically finished with the exception of closing one opening left in the dam to carry the water through until the roads and bridges to take the place of the roads and bridges which will be flooded are completed, and all the properties which will be flooded are secured. This dam has been built of solid concrete and has a base 110 feet in width, which is sufficiently wide to carry the dam up to the elevation of 237½ feet. When it becomes necessary to raise the dam, the work can be done without any cofferdams and with very little additional excavation in the side hills. The actual work of raising the dam could probably be done in from six to eight months.

Every possible precaution has been taken in building the dam to make it

absolutely secure, and all the precautions known to the hydraulic engineer have been embodied in the construction of the dam to make it perfectly safe. The cut-off wall, about 20 feet wide, was carried down from 15 to 25 feet below the main foundation of the dam, and under the main foundation of the dam a system of underdrains was installed which will practically make it impossible for the pressure of the water to exert any uplifting influence on the bottom of the dam.

A system of internal drains in the body of the dam will take care of any water which might seep into the joints of the masonry, and will reduce the possibility of internal stresses in the dam to a minimum. The intake of the water at the gatehouse is so arranged that the water can be taken either from the surface or from the bottom of the lake. The advantage of such an arrangement lays in the fact that when the water is turbid it settles clear more rapidly in the upper strata, and this clear water can be taken into the city. On the other hand, at certain seasons of the year the upper layers of the water have algae growths in them, and this algae causes unpleasant taste and odors in the water supply, and these can be avoided by drawing the water from the bottom. If, however, the supply of dissolved oxygen in the bottom waters becomes exhausted, the bottom waters are apt to become unpleasant to taste and cause odors, due to the decay of organic matter, and it then becomes necessary to draw the water from the upper layers, which still contain sufficient dissolved oxygen to oxidize the organic matter contained in the water without putrefaction, for putrefaction only takes place where there is no oxygen present.

The building of the new dam will flood three roadways and will make it necessary to build about seven miles of new road. These roadways will extend from the new dam through the beautiful Loch Raven Valley about 15 to 25 feet above the water's edge for most of the way to a point about two miles above the new dam. At this point, where the valley widens out into the expansive Dulany Valley, a bridge 600 feet long will cross the new reservoir. The Lake Drive from the dam to this bridge will be a fine macadam roadway, while from the eastern end of the bridge a new concrete roadway will extend a distance of approximately two miles to connect with the Dulany Valley and Sweet Air Turnpike. The third new road will be built from the Dulany Valley and Sweet Air Turnpike to the Jarrettsville Turnpike, and will connect with the second bridge, which will be 954 feet in length.

These bridges will be two of the finest highway bridges in the United States, if not in the world. They were designed by Mr. J. E. Greiner, and their beautiful location was kept in mind in their design. Without any elaborate attempts at ornamentation, they have been so designed that they will fit in harmoniously with their surroundings.

The construction of the 600-foot bridge was accomplished in a very novel



CONCRETE FILTER TANKS, NEW WATER-WORKS SYSTEM

manner by building the false work as the suspension bridge, and the permanent structure was built on top of this false work. The shorter bridge is now completed, and the second bridge is practically finished. The last of the four spans was recently erected and the work of putting down bridge flooring was begun.

The old tunnel carrying the water from Loch Raven to Lake Montebello, inside the city limits, was built of sufficient size to carry about 200,000,000 gallons of water per day into the city, and as the present daily supply to the city rarely exceeds 90,000,000 gallons of water, it can be seen that this old tunnel still has sufficient capacity to last for a number of years in the future. As the new dam was built one-half mile above the old dam and the old gatehouse, it was necessary to build a 10-foot steel conduit surrounded by concrete on the outside and lined with $1\frac{1}{2}$ inches of reinforced cement mortar on the inside. This conduit is practically completed. A novel feature of this construction was the placing of this mortar lining by means of a cement gun.

The old tunnel will be placed under a pressure of about thirty pounds, and as most of it is through solid rock it will only be necessary to reline the first mile of the total length of the seven miles of this tunnel. This work will not be constructed until the water is stored back of the new dam, as the water will have to be brought to the city through the tunnel at the same time it is being lined.

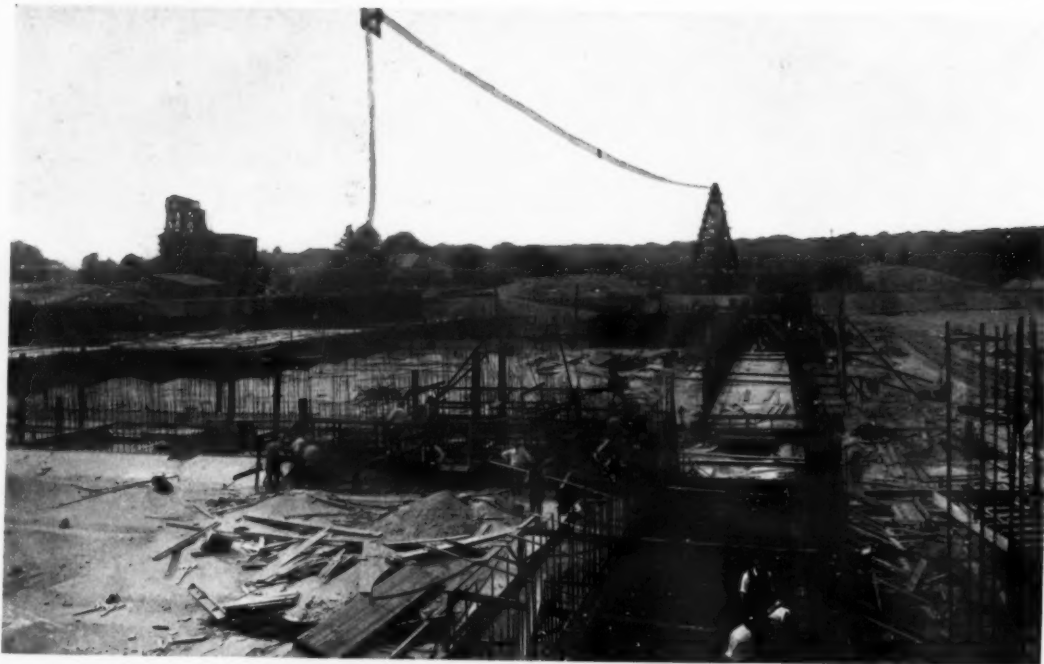
This will be accomplished by filling Lakes Montebello and Clifton with about 750,000,000 gallons of water and then shutting off the water from the tunnel and draining it, which will make it possible to go in and work for about a week inside the tunnel

while the city's water supply will be taken from the water stored in Lakes Montebello and Clifton. With the water stored back of the new dam it will be possible then to rapidly fill these lakes, when the tunnel can again be drained and the work carried on. This will be repeated until the lining and strengthening of the old tunnel is completed.

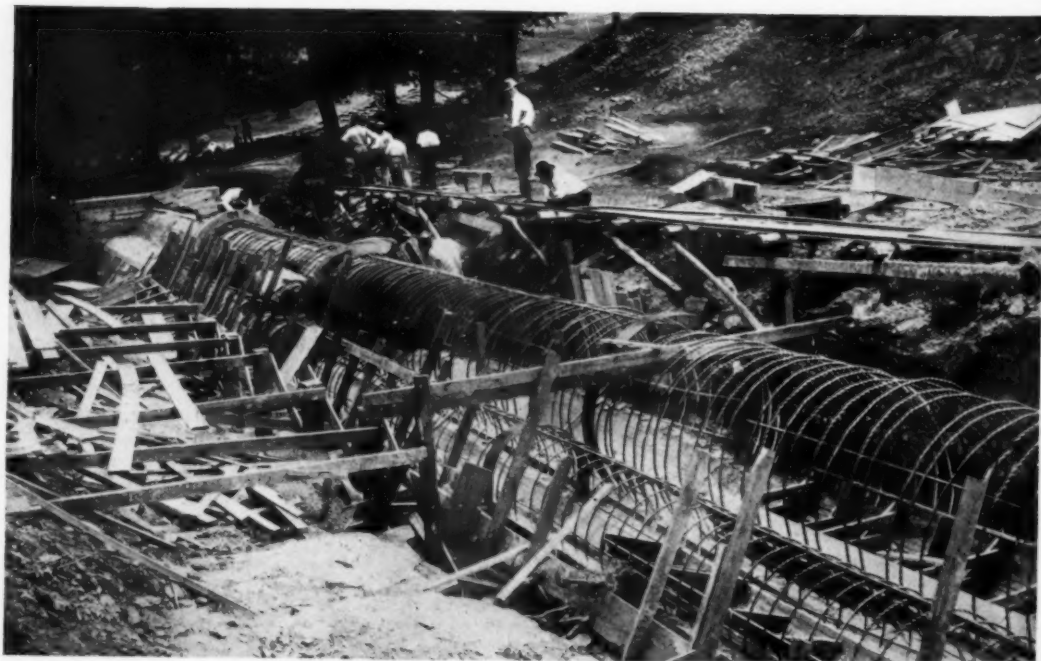
Inside the city limits a new nine-foot pressure conduit is being built from the filtration plant to connect with the existing city mains. The greater length of this tunnel will be built inside of the old tunnel between Lakes Montebello and Clifton. The head which this new pressure conduit will have to stand will amount to about 35 pounds per square inch, and the conduit will be built of separate sections of reinforced concrete pipe. This is the first large pressure tunnel of its kind to be built, and it was only decided upon after a number of experiments had been made demonstrating the tightness of the joints between the different sections of the reinforced concrete pipe. By building this reinforced concrete conduit inside of the old tunnel a saving of over \$100,000 to the city was effected.

A filtration plant of the mechanical or rapid filter type of construction, which is well under way, is being rapidly pushed to

completion. This plant will be one of the most complete filter plants of its kind in the country and will practically eliminate all possibility of typhoid fever germs from the water supply. This plant will consist of 32 units, each having a rated capacity of 4,000,000 gallons per day, making the total capacity of the plant 128,000,000 gallons per day. The chemicals will be added to the water in a head house equipped for economically handling these chemicals. The water will first pass through a mixing basin in which



GENERAL VIEW OF FILTRATION PLANT CONSTRUCTION



REINFORCED CONCRETE CONDUITS UNDER CONSTRUCTION

the chemicals will become thoroughly mixed with the water. The water will leave the mixing basin and enter two large coagulating basins, where a great many of the impurities will be settled out before passing through the filters. After filtration the water will be further treated with liquid chlorine, which will kill any possible germs which might have passed through the coagulating basins and the filters. Two covered storage reservoirs for the filtered water are nearing completion.

In order to get the water to the filtration plant it was necessary to build a low-lift pumping station, in which are being installed four large centrifugal pumps, one with a capacity of 50,000,000 gallons per day, two with a capacity of 40,000,000 gallons per day, and one with a capacity of 30,000,000 gallons per day.

By this arrangement it will be possible to use the pumps at their rated capacity so as to meet the city's demand for water. The combination of the 40,000,000 and 30,000,000-gallon units will give 70,000,000 gallons per day, while the combination of the 50,000,000 and 30,000,000-gallon units or the two 40,000,000-gallon units will give 80,000,000 gallons per day. By means of these combinations it will be possible to always operate under the most efficient conditions, as it is well known that centrifugal pumps operate most efficiently at their rated capacities. In addition to this low-lift pumping station a new 30,000,000-gallon pumping unit has also been installed in the Mount Royal Pumping Station, which will be utilized to pump the water from the filtration plant level to the high-service districts. This new pump is a vertical triple expansion pumping engine, and there have also been two batteries of two boilers each installed for operating this new engine, as well as all the necessary steam piping for the engines and boilers and economizers for heating the feed water. These boilers will be equipped with mechanical stokers of the underfeed type, which will prevent all possi-

bility of smoke nuisances in the fine residential section which adjoins the Mount Royal Pumping Station.

The contract for the dam is now completed and all work in connection with the dam is completed with the exception of closing one of the relief openings shown in the picture at the head of this article.

The conduits leading from the new dam to the old Loch Raven-Montebello tunnel are completed, and it is only necessary to build a connection between the two tunnels to put this part of the work into operation.

At the filtration plant inside the city limits the work has been divided into

a number of contracts and work has been begun on each one of these contracts. The excavation and concrete work for the main filtration plant are progressing with great rapidity, and it is hoped that this part of the work will be completed shortly after the first of January, 1915. A large part of the filter equipment is on the ground and the head-house and pumping stations are rapidly nearing completion with the exception of the superstructures, the contract for which has just been awarded. The contract for the filtration plant was first advertised as one large contract, but the prices bid were so high that all bids were rejected.

By dividing the work into a number of contracts the city was able to save about \$325,000, and upon the completion of the filtration plant Baltimore will have one of the most modern and well-equipped filtration plants in the world and will have procured it at a most reasonable price. It is expected that the filtration plant will be completed, ready for filtering water, by May of 1915, and the entire work, including the grading and parking of the grounds, will be completed by the end of next year.

The accompanying illustrations give some conception of the magnitude of the undertaking and especially indicate the heavy concreting work involved.



EXTERIOR OF RESERVOIR FOR STORAGE OF FILTERED WATER



INTERIOR OF REINFORCED CONCRETE RESERVOIR FOR STORAGE OF FILTERED WATER

Most Up-to-date Fire Protection System



THROWING STREAMS OVER THE TALLEST SKYSCRAPERS

THE high-pressure service, added to Baltimore's fire department equipment in 1912 at a cost of about \$1,000,000, covers an area 170 acres in extent in the heart of the business section of Baltimore. The installation of this service, adding greatly to the already high efficiency of Baltimore's fire department, materially reduced fire-insurance rates within the district, as no fire has since gotten out of the building in which it started. In the past, cellar fires have meant practical demolition of the building, at the best. In several cellar fires since 1912 the fire has been confined to the cellar, and in the case of the Eutaw House fire, which started in the cellar, but was confined to the building, there would have been great difficulty in controlling the fire if the high-pressure system had not been in use. While the high-pressure system now covers the greater part of the congested value district, it is the recommendation of the Committee on Fire Prevention that it be extended to include not only the entire congested value district, but any other sections that are rated extra hazardous.

The Eutaw House fire was the first and the severest test to which the service has been put. Previously a demonstration had been made at City Hall Plaza, when 24 lines of 2½-inch hose were in service at one time. Streams

then were easily thrown higher than the tops of the tallest skyscrapers. Several tests have been made by National Board engineers, covering both readiness and capacity of the station, with entirely satisfactory results.

There are nearly nine miles of mains, 3¼ miles being of 16-inch and 5½ of 10-inch pipe. All pipe is of lap-welded, soft open-hearth steel, the only high-pressure system in the country so equipped. The pipe is designed for a maximum working pressure of 300 pounds per square inch. All pipes, including valves, hydrants and fittings, were tested at a pressure of 600 pounds per square inch.

There are 226 specially designed flush-type hydrants in the high-pressure service district. Hydrants are located between street intersections, between corners of building lines and curb corners, at alley intersections and alternating on opposite sides of streets. The service head is portable, and on removal of the sidewalk cover it is locked into position with a single turn in a second's time. While the type of hydrant is unusual for such service, it appears not to increase the time consumed in getting into action at fires. It is believed that the system of inspections adopted and the steps taken to secure familiarity with locations will result in hydrants being quickly found, and the ease with which heads can be attached removes one of the main objections to the use of flush hydrants.

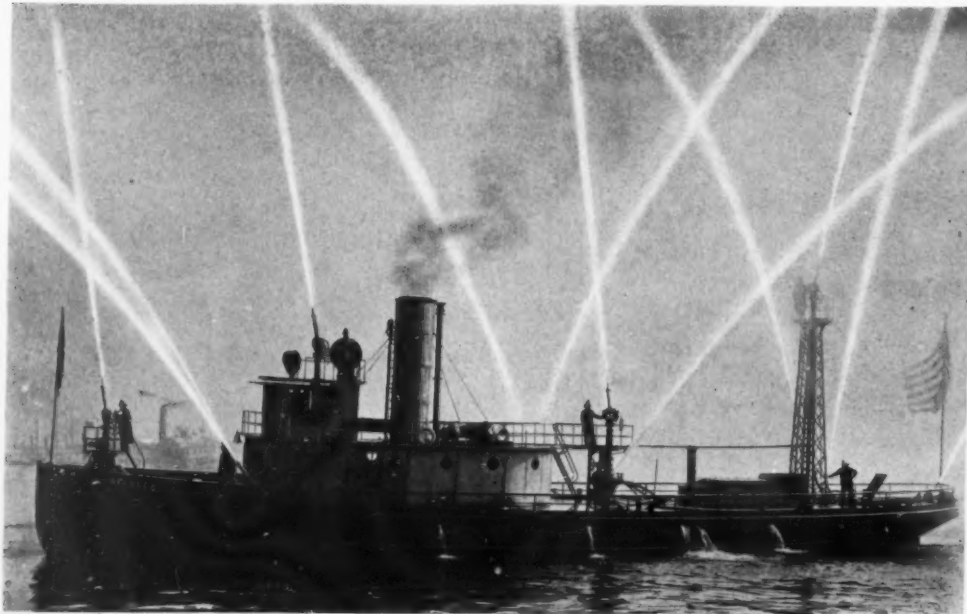
Hydrant heads are provided with fire openings, for 2½ and 3-inch hose. By using Siamese connections additional lines of hose can be secured from the same hydrant. There is one "Jumbo" monitor nozzle, with 2½, 3, 3½ and 4-inch tips, that can throw 7000 gallons of water a minute, equal to a weight of 28 tons. With it anything short of a monolithic concrete building could be battered to pieces.

For this service a pumping station of concrete construction was erected. It is equipped with three Allis-Chalmers pumps, each with capacity of 7000 gallons a minute, or a total of 84 tons of water per minute. A working pressure is maintained on the system at all times, so as to be ready for instant service, and to be increased as occasion demands. A separate, complete fire-alarm system has been installed between the street boxes and the pumping station. Forty to fifty high-pressure lines can be operated at one time. Operation of the plant is prompt and reliable. With automatic arrangements at the pumping station, by which the pumps respond automatically to increased demands, and the constant operating pressure at fires of 250 pounds, made possible by the use of the regulator valves on hydrants, there is no necessity for communicating with the pumping station to secure any pressure desired.

Automobile hose wagons are operated in connection with the system, carrying not less than 2000 feet of 3-inch hose, monitor pipes, deluge sets, and all modern appliances for the heaviest fire service.

Two fireboats have been fitted up as auxiliaries to the high-pressure service. One, The Deluge, has a capacity of 12,000 gallons a minute; the other, The Cataract, of 7000. In addition to the four monitor pipes there are provisions for connections on each for 24 lines of hose. If any trouble should occur at the pumping station, or if auxiliary service should be desired, the boats can be tied to a dock and the boats' engines used on the high-pressure system in the city. The boat, of course, uses harbor water. The pumping station is connected with the regular water-works system of the city.

With steel pipes there is no electrolysis to contend with. As an extra precaution against any action of the water of the harbor or deteriorating effects of any sort, it is proposed to treat the auxiliary suction pipes from the harbor with a protective coating of bitumastic enamel.



FIREBOAT DELUGE THROWING TWELVE STREAMS



JUMBO NOZZLE IN ACTION

Spending \$15,000,000 for Repaving Every Street and Alley

NO single feature of the great work of rehabilitation which Baltimore has undertaken will give more delight to the eye or more comfort to the citizen and the stranger, or add more to the reputation of the city abroad, than the entire repaving of every street and alley in the city. It would be a notable feat if Baltimore were simply adding the completing touches to an already tolerable system of paved streets, but striking emphasis is given to the importance of the improvement when it is borne in mind that up to the beginning of 1912 the city had on its hands 350 miles of cobblestone streets and alleys, aggregating 5,000,000 square yards, or, if diverted into a roadway 18 feet wide, a stretch 500 miles long of the worst type of pavement surviving from primitive conditions which could be found anywhere in America. The fact that this condition is to be entirely eliminated and every street and alley in Baltimore paved with modern materials is indicative of the new spirit which now possesses Baltimore, and it gives this municipality pre-eminence as the first city in the world to undertake the entire repaving of all its streets.

The repaving work is being done by three commissions: the Street Paving Commission has charge of all the streets within the city proper; the Commission on the Opening of New Streets has charge also of the paving of streets in the annexed districts, and the State Roads Commission has charge of all State roads, even when they terminate in the heart of Baltimore city. Altogether some \$15,000,000 is being spent in giving to every road leading into the city and every street and alley in the city in the annexed districts the best pavement applicable to the conditions of traffic or travel in each case. The various kinds of material include bituminous concrete, asphalt block, sheet asphalt, granite block, vitrified brick, creosoted wood block, and in the cases of some of the country roads asphalt-coated macadam, although a number of the country roads are paved with sheet asphalt.

The work was begun something more than a year ago, and up to date about 65 miles of new paving have been laid within the city. The funds for the work will be available at the rate of about \$1,000,000 a year, so an estimate of 500,000 yards a year is made as to the average progress of the work. It is figured that some seven years further will be required to complete the work, which it is proposed to carry on at the rate of about a mile a week.

The beginning of the movement for better streets dates from a municipal election held in the spring of 1911, when a vote was taken on a proposition to make two paving loans (or bond issues as they are described in other States), one of \$5,000,000, to be expended in paving generally, and the other of \$2,500,000, to be expended exclusively in the annexed section of the city. These loans had previously been authorized by the Legislature, sessions of 1908 and 1910, but the enabling act contained a clause prohibiting the construction of improved pavements under these laws until all sewers, both sanitary and storm water, had been completed. As Baltimore had, until recent years, been without any system of public sewers, and it had been determined to thoroughly cover the city with a most modern sewerage and drainage system, the undertaking was so gigantic that it necessarily required time to carry out. While this caused a delay in beginning the paving work, it has been everywhere conceded that the provision was a wise one and that the completion of sewers in advance, while it might delay the beginning of paving operations, would result in a finished condition when the work was finally carried out. In connection with these plans a general order was issued by the Mayor, to the effect that everything in the way of underground work, sewer connections, conduit system, water pipes, and everything else relating to the underground plant of a city, must be installed before the paving is laid. This warning is exhibited around Baltimore in every street and alley where paving operations are about to be begun, and by authority of the Mayor announcement is made that when the paving is completed no permit will be granted to disturb or dig into the street for five years after the completion of the work.

Immediately after the passage of the loan in the spring of 1911 the paving commission was appointed and organized. The work of organization required some little time, and, as a comprehensive plan had to be laid out, the work of actual paving was not begun until 1912. One of the first acts of the Commission was to prepare an estimate, showing what it would cost to completely eliminate the cobblestone streets and alleys over the entire city. It was found that about \$12,500,000 would be required to completely pave the city of Baltimore from one end to the other, including streets and alleys. In order to raise the \$5,000,000 needed in addition to the loans, the Commission instituted what is known as the paving tax, a retroactive measure which is applicable to all improved paving above the grade of cobblestones, which had previously been laid by the city out of the general fund without expense to the property owner, as well as to the streets now being paved. Briefly stated, this plan works out about as follows:

The streets are classified as to widths between curbs as "A," "B" and "C," with rates per front foot per year for a period of ten years of 15 cents, 10 cents and 5 cents, respectively, regardless of the class of improved paving. Certain concessions are allowed corner property, portions of the side being free, whether residential or otherwise.

By the application of this tax in the streets already paved and those to be paved, the Commission will be able to raise from \$4,000,000 to \$5,000,000 additional to the loans, and in this way means are provided to so pave the city of Baltimore that it will take the highest rank among any of the American municipalities.

In tabulating the estimate the Commission had in mind the placing of improved granite block on heavy traffic streets, vitrified block on medium

traffic streets, sheet asphalt on light, and bituminous concrete (Topeka specifications) on exceedingly light traffic streets, all on a concrete base. All streets and alleys 30 feet between curbs and under the Commission figured on paving with vitrified block. This plan has been followed very closely in actual operations, except that sheet asphalt has been put on some rather heavy traffic streets where the elimination of noise was quite a factor.

An attempt was made at first to utilize the old cobblestone surfaces on light traffic streets as a base and resurface this with sheet material. This plan was soon discontinued, however, as it was not found to be economical, owing to the fact that the streets had been previously dug up to a large extent for the construction of sewers, water and gas pipe, etc.

In all of the present work the cobble is removed to convenient crushers and the cobble crushed up and used by the contractors in concrete base.

The city maintains its own laboratory, where all materials, such as asphaltic cements, Portland cement, vitrified block, etc., are tested, so that the municipality is assured that it obtains the proper materials in accordance with the specifications.

There are five asphalt plants now in operation in this city, while fifteen general contractors are engaged upon all classes of paving work. Inspectors are placed at the plants, as well as on the street, to see that the materials are proportioned, mixed and sent to the street in the proper manner.

Laboratory tests are drawn from both plant and street, and the proper tests made to see whether or not they conform to the specifications.

Including the improved paving which had been laid before the paving commission began its operations and adding the work done to date, there are some 230 miles of modern paving on the streets of Baltimore out of the total city mileage of 556.67. At the present time work is under way on forty streets, and contracts for another forty jobs of work, covering some twenty miles, have been awarded, but work has not yet started. However, with favorable weather, it is expected that all of this work will be finished during the year. A million and a half dollars worth of work is under contract this year, which is accounted for by the fact that funds had accumulated before the Commission had completed arrangements for beginning the work, and the Commission has only caught up this year. Hereafter it will go ahead at the rate of about a million dollars worth of work a year.

The city is singularly fortunate in the personnel of its Paving Commission, the membership comprising a number of its most substantial citizens. R. Keith Compton, an engineer of high standing, is chairman and consulting engineer. Mayor Preston is an ex-officio member. Douglas H. Thomas and Samuel C. Rowland, leading bankers of Baltimore, are members, the others being Leonidas G. Turner and W. S. Thomas. The character of the work being done demonstrates the efficiency and fidelity of those in responsibility.

While nearly every city in the country now has its "White Way," and this improvement has been adopted to a remarkable degree by even the smaller cities of the Southeastern States, the claim is made that no city in the world has a more beautiful and extensive system than Baltimore. The "White Way," or ornamental system of street lighting as installed in Baltimore, will cover eight miles of streets in the business section of the city, when all of the thousand lamps included in the original plans have been installed. Over five hundred have been placed in the last few months, and the system will be completed before the end of this year. The new lamps are of the inverted, luminous arc type, attached to ornamental lamp standards, and they are of 6.6 ampere and 80 volts, or a voltage of 528 per lamp. On the boulevards and in the residential sections of the northern end of the city there have been recently installed quite a large number of ornamental lamps, 60 candle-power, incandescent, electric, erected on single ornamental standards.

About 54 miles of paving has been done in the annexed districts of Baltimore since the Annex Improvement Commission began the work in 1906. In the first seven months of 1914 six miles have been completed and five miles more are under way, four of which will be completed by October 1.

As the Annex Commission work includes the making of streets as well as their paving, the number of miles paved gives only a partial indication of the Commission's activities. The grading of streets requires more time than the actual paving. Serious delay is occasioned not only by the actual amount of grading that has to be done, but the grading uncovers water pipes, gas pipes, private sewers and other underground structures, all of which have to be lowered. To lower a water main or a gas main, together with all of its house services, is a slow and tedious process, and it is necessary for the grading and paving operations to be completely suspended while the various obstructions are being removed.

Among the larger paving projects the Commission has now under way is Thirty-third street from St. Paul street to Hillen road. Here is being created a fine new boulevard, there being two driveways 24 feet wide, with a parking space between them 40 feet wide. It will be an important link in the park and boulevard system of the city. Thirty-third street is an absolutely new street, it having been legally opened by the Commissioners for Opening Streets in 1913. The length of this boulevard from St. Paul street to Hillen road is a mile and a half. The grading has been completed and the street is in the hands of the various city departments and public service corporations for the installation of gas pipes, water pipes, electric subways and sewers and drains. As soon as all the underground structures are completed the actual paving will be pushed to an early completion. The grading done on Thirty-third street amounts to about 100,000 cubic yards. This is an indication of the extent and character of the work the Commission is doing.



TYPE OF OLD COBBLESTONE, OF WHICH BALTIMORE HAD MORE THAN ANY OTHER CITY IN THE WORLD, WHICH IS RAPIDLY GIVING PLACE TO MODERN PAVEMENT



ONE SIDE OF BALTIMORE STREET WITH ITS NEW PAVEMENT WHILE WORKMEN ARE PUSHING THE REPAVING OF THE OTHER SIDE WITHOUT HALTING TRAFFIC, A UNIQUE ACHIEVEMENT BY THE CONTRACTORS AND STREET RAILWAY COMPANY, AND THIS IS TYPICAL OF HOW THE WORK IS BEING DONE ALL OVER BALTIMORE WHERE \$15,000,000 ARE BEING SPENT IN PAVING



ILLUSTRATION OF MANNER IN WHICH BALTIMORE STREET, THE BUSINESS HEART OF THE CITY, WAS PAVED, ONE SIDE AT A TIME WITHOUT INTERFERING WITH THE MOVEMENT OF THE STREET CARS OR VEHICLE TRAFFIC. ENGINEERS AND CONTRACTORS ARE FINDING MANY VALUABLE LESSONS HERE WHICH CAN BE PROFITABLY EMPLOYED WHEREVER SIMILAR WORK HAS TO BE DONE



CONSTRUCTION ACTIVITY IN STREET PAVING



GLIMPSES OF BALTIMORE'S MODERN STREETS. THE BEAUTIFUL AVENUES AND BOULEVARDS, WITH WHICH THE CITY ABOUNDS, ARE BEING PAVED IN THE MOST UP-TO-DATE MANNER

The Street Railway's Operations in Building and Maintaining a Great System



VIEW OF RELAID TRACK IN CONNECTION WITH NEW PAVING

WITH 403.3 miles of track, the United Railways & Electric Co. of Baltimore has a length of line that if laid continuously would reach from Baltimore to a considerable distance beyond Pittsburgh on the west, or would extend almost to Boston on the north, or to Charlotte, N. C., on the south. It serves a population of 700,000 people in the city and suburbs of Baltimore. For the year ending December 31, 1913, it carried 182,180,767 revenue passengers, about 41 per cent. of whom availed themselves of the transfer privilege, and earned gross \$9,046,492.

In enterprise it is at the forefront of the street railway systems of America, and consequently of the world. Thorough organization and ability mark the administration of the company's affairs; its equipment is of the highest standard, and it has adopted, in its track and roadbed construction and in its shop work, the most modern devices and appliances that have proved to be the best.

Out of the first street railway company chartered in Baltimore fifty-five years ago and others that followed, there has grown the present system, representing a \$75,000,000 investment, and being without floating debt today, while at the same time these companies have paid a park tax to the city aggregating a total of almost \$12,000,000. By the provisions of the original charter 20 per cent. of the gross earnings of the company were to be paid over to the city for the purchase and maintenance of public parks. This rate continued for fifteen years, when in 1873 the burden became so great the city cut the rate to 12 per cent. and a few years later to 9 per cent., at the same time reducing the street-car fare from six to five cents. It has remained at 9 per cent. since 1883, and for the last ten years has averaged a revenue for the park fund of half a million a year. The estimate this year is for \$600,000.

This tax is sufficient to take care of maintenance and also provide for a sinking fund to pay off the bonds issued to make purchases of park lands. This is a unique provision, exacted by city fathers of a half century ago, and while at first blush it might appear burdensome, it may be that being constructively a partner in the enterprise the city's manifest interest in the prosperity of the company is a compensative factor of substantial value. The city would certainly never want to oppress an active, producing partner, no matter what passing whim might seize some accidental administration. Operating under a perpetual charter, the payment of this tax fund appears destined to go on forever.

At the present juncture the United Railways is passing through another wholly unprecedented experience. With Baltimore putting in a complete new sewer system, covering every portion of the city, and laying modern pavements on every street and alley, and with the municipally-owned conduit system being laid to put every electrical wire under ground, a condition exists here such as never confronted a street railroad before in the history of the world. The streets are not to be torn up for five years after the new paving is laid, so the conduits, the sewers, the high-pressure water mains and all other pipes and underground "running gears" of a great municipality have to be laid ahead

of the paving, and the street railroad has to put its tracks in shape for at least five years of ever-increasing service, keeping in step with the pavers, not being permitted to go ahead of them, and it being impossible for them to lag behind. Work of this sort is going on on fifty streets at a time, and some of them are the busiest in the city, and yet so well has the company managed the situation that traffic has not been interfered with to such an extent as to arouse any protest, and the street railway work has kept up with the paving, which in many instances has been done in record time.

After an extended trip over the South the representative of one of the largest steel rail manufacturers of the country stated that Baltimore's street railway is practically the only system in the South doing any considerable amount of reconstruction work at this time. As a matter of fact, the operations of this company are more extensive than in any period of the fifty-five years of the company's life. Coming like an avalanche, when everything had to be done at once, organization, executive ability and money in large sums were required to handle the extraordinary situation. A gigantic and most difficult piece of work is being handled in a remarkably efficient way.

On Baltimore and Howard streets, especially, the work was accompanied by many difficulties, not only in traffic maintenance and operating conditions, but also because of the extraordinarily large amount of special track work involved at the numerous intersections, where the various car lines converging to the heart of the city connect. Some of this special work was the most complicated in this or any other city.

On many of the streets new rail was laid, and on Baltimore and Howard streets, not only were new 125½-pound rail put down, but a new system was worked out by which a concrete foundation was installed without interruption to traffic or the operation of the cars. Instead of closing the street to all kinds of traffic for ten days or two weeks while the concrete was setting, which is the usual way, the new tracks were stone-ballasted and tamped between and



COMPLICATED SPECIAL WORK IN UNITED RAILWAYS TRACKS
PREPARATORY TO REPAVING

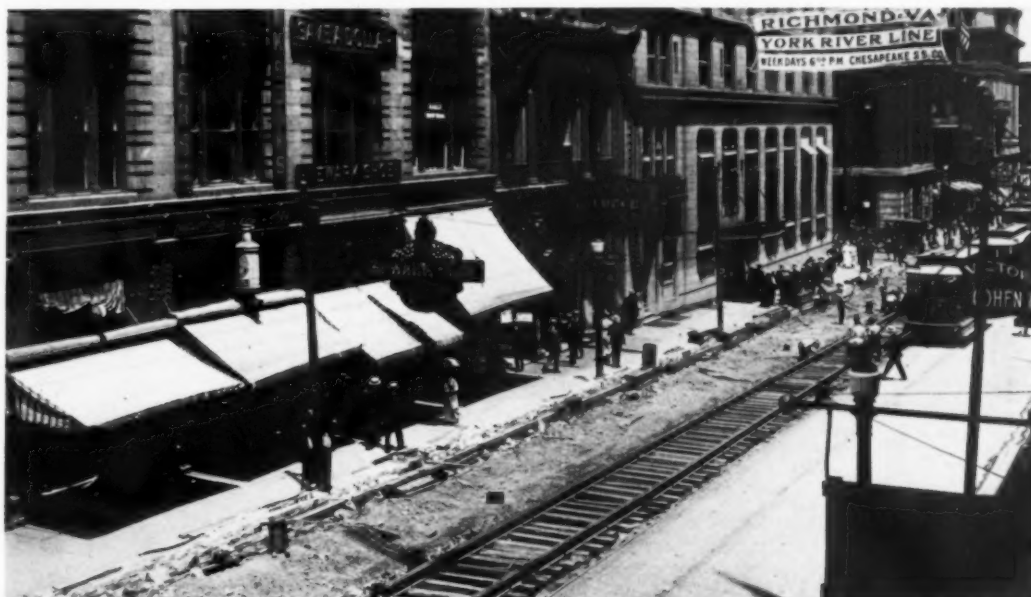


PREHEATING RAIL ENDS FOR THERMIT WELDING OF JOINTS

below the ties, and then the voids of ballast were filled with a mixture of sand, cement and sufficient water to carry the mixture into all spaces between the stones. A special grouting machine, mounted on wheels and driven by gasoline, distributed the grout in an ingenious manner, and the process saved not only time, but money as compared with concrete laid in the usual way.

In this and in other work the United Railways has adopted and frequently improved the most modern appliances and methods of construction. In addition to using the heaviest groove girder rails, in 60-foot lengths, the process of joining and fastening down the rails is in accordance with the most substantial and enduring methods. The rails are fastened to the cross-ties by means of steel tie plates and screw spikes. Holes are bored in the ties before laying, and the screw spikes are driven into the ties by an electrical screw-driving machine which gets its current from the trolley wires by means of a fish pole attachment. The holding power of the screw spike is rated at two to three times as much as that of the ordinary square spike, and there is practically no tendency to get loose. This and other costly methods of construction are justified because durability is requisite. It is a very expensive proceeding to make any repairs where a costly pavement is to be taken up and relaid.

The joining of the rails is also done in the most modern and thorough manner. The rail ends are "budded" or brought snug together and riveted and welded so as to practically eliminate the joint and provide a continuous rail. The fishplates are heavy steel bars an inch thick, fitting snugly against the rail web, as well as under the rail head and over the base, and are firmly secured by one-inch diameter rivets, driven hot. Then the rails are welded together and to the fishplates by pouring six to eight pounds of molten steel around their base. This is done by the "Thermit" process, one of the wonderful discoveries of metallurgy. It is based on the great affinity of aluminum for oxygen. A mixture of finely granulated aluminum and iron ore is placed in a crucible and ignited. Combustion is complete in less than half a minute.



THREE VIEWS SHOWING REBUILDING WORK OF RAILWAY IN CONNECTION WITH REPAVING ON BUSIEST STREET IN BALTIMORE WITHOUT INTERFERING WITH MOVING OF TRAFFIC

The liquid steel, at a temperature of 5500 degrees F., flows from the crucible into the mold built up around the joint, and at such heat that a thorough fusing of rails, fishplates and Thermit steel results. The joints are so thoroughly united as to prevent any looseness or movement of the rails, and are also 100 per cent. perfect electrically, eliminating the necessity for the expensive copper bonds required on all ordinary bolted joints. The Thermit process was first used in Cleveland, but was improved when adopted by the engineering department of the United Railways Company.

A joint thus treated requires no attention until the rail itself wears out—a period of twelve to twenty years. The old type joint would require overhauling three or four times during the life of the rail, and sometimes a complete new joint would be necessitated. So a Thermit weld, expensive as it is, costing about \$10 a joint, saves in the end two or three times the amount the ordinary method would require.

It is an interesting fact that in a girder rail track securely imbedded in a street pavement, and with secure joint fastenings, no consideration need be given to the enormous forces resulting from contraction and expansion, due to changes in temperature. On account of the "grip" of the pavement on the rails, so it is explained, they cannot buckle under the heat of summer.

In addition to the track work, the overhead feeder cables are being taken down and installed in the conduits laid by the city.

As there are nearly 5000 special work layouts on the railway system—frogs,

switches, mates and crossings—the company has a thoroughly equipped shop, with rail saws, planer, punch, rail benders, grinders, etc. The shop equipment is sufficient not only for necessary repairs, but many of the frogs required for the replacement of those worn out are manufactured there.

The shops for the repair and maintenance of cars and all rolling stock and vehicles of the company are on a conveniently located tract of 32 acres, opposite Carroll Park, with track connection with the Baltimore & Ohio Railroad. Two groups of buildings, with a total ground floor area of over 328,000

square feet, occupy eight acres; eight acres are devoted to a storage yard and 16 acres are held for future development as required. There are eight immense buildings, in which are a woodworking plant, car repair shops, blacksmith shops, machine shop, electrical department, storeroom and offices for superintendent and various heads of departments. At some distance from the shops is a fireproof reinforced concrete oil and paint storage building. All the shops are fully equipped with machines and appliances to take care of any and all features of repair work, electrical and otherwise. Cars are overhauled whenever necessary and maintained at a high standard of efficiency.

The major portion of the company's car equipment is of the Brill semi-convertible type, which, with its ready adaptation to all sorts of weather conditions, summer and winter, very satisfactorily meets local requirements. All recent purchases have been of the "pay-as-you-enter" type. A late order of 85 cars, now being delivered, are duplicates of the standard type heretofore installed, except that the platform, instead of being open, is enclosed with vestibule doors and the steps to the platform fold up as the vestibule doors close, thus rendering it impossible to board or leave the car when it is in motion. Cars are equipped with electric heaters and other devices for the comfort and convenience of passengers.

By an ingenious system, every car line is given a designating number. For instance, every car on the Roland Park Boulevard line is numbered in the twenty-nine hundreds and the numerals 29 are displayed prominently on the front of the car. All of the St. Paul Street line are in the seventeen hundreds, and so on; thus the line of cars desired can be readily distinguished by any one at a considerable distance.

A feature of the company's management which is of interest and significance is the attention given to the employees' comfort. The several carbarns throughout the city are substantial structures of fireproof construction and striking in appearance. They are fitted with clubrooms and other conveniences for the men in the employ of the road, and are much used and appreciated by them. President William A. House, who entered the service of the company as a boy 35 years ago and worked his way up through the ranks, is a thorough

disciplinarian and a tireless worker, and he crowds things along in the way he deems they should go, but his consideration for the comfort and well-being of his men is proverbial. Perhaps this has something to do with the characteristic courtesy of the conductors and motormen on the Baltimore lines. At any rate, visitors from other cities make gratified comment on their experience with the Baltimore type of street-car employee.

The property went through the experience common to all such undertakings, for it passed from horse to cable, and then to electric operation. Frequent improvements in street railway equipment and methods made numerous and costly changes necessary. It has constantly experimented, trying out the first crude efforts at electrification, when an electric motor was attached to a small car and operated for a time, its power being received through a third rail, after which the overhead trolley lines were built, so that Baltimore disputes with Richmond the distinction of being the first city to operate a car line electrically. In 1899 the complete unification of the various street car companies was effected, and their development into one of the great street railway systems of the country, over \$20,000,000 having been spent in the past fourteen years in betterments and equipment. In the great fire of February, 1904, the Railways Company was one of the chief sufferers. Directly after that conflagration it was stated by one of Baltimore's leading citizens that the vigor and energy displayed by the United Railways Company in restoring its car service did more than every other agency combined to encourage the people of Baltimore and hold them together after the great disaster that had befallen them.

The great modern power plant, located on Pratt street, has taken the place of the horse and mule power of earlier days. This plant is a model of efficiency in its line, with 52,500 rated horse-power, and kept in top-notch condition, though used now only as an auxiliary to the power furnished by the Susquehanna River development at Holtwood, 40 miles away.

In organization, equipment and executive ability displayed the United Railways Company is interesting as a study, because it is typical of the spirit with which the men and the institutions here are meeting the requirements of the reborn Baltimore of today.

Nearly \$170,000,000 Put Into New Buildings Since the Great Fire

ABOUT \$170,000,000 have been spent in building operations in the city of Baltimore since the great fire of 1914, according to the figures furnished by the Building Inspector. This, of course, does not include suburban construction, as in the case of Roland Park and other residence suburbs, or industrial developments located outside the city limits, especially on the eastern side of the city and at other points, which amount to many millions more.

The fire destroyed 1526 buildings. The loss of buildings and contents is officially estimated by city authorities at \$125,000,000. All but half a dozen or so of the lots in the fire zone are now occupied, and in nearly every instance a better and more costly building has been put up than the one that was destroyed.

A vastly significant feature revealed in a study of the figures is that over 23,000 dwelling houses have been built here in ten years at a cost of about \$40,000,000. The low average—under \$2000 apiece—indicates that a very considerable number of these houses are homes for workingmen, and this is a phase of Baltimore's past, present and future development to which vital importance is attached. Comfortable homes, with a character-forming privacy and individuality, impossible where families are huddled in tenements—Baltimore being almost wholly without tenements—insure a dependable population of workmen, families who are part of the citizenry of the place and who provide a foundation for an industrial development such as no other city of Baltimore's size is blest with. No other single feature is appraised so highly in calculations as to the great industrial expansion which should come to Baltimore, as the fact that the large population of working people have now and always have had comfortable, attractive home surroundings. This is a well-rooted fixture in the routine of Baltimore's everyday existence.

A survey of building operations since the fire of 1904 demonstrates that the lessons of the fire have been taken advantage of in a very comprehensive manner. The city at the time of the fire was operating under an old building code, which made a book of only a few pages. Following the fire efforts were centered on working out an adequate and modern building code, which was finally issued in 1908, and is a volume of 173 pages. The aim has been to make the Baltimore code conform to the best building practice, and it is said to be even somewhat stronger than in many of the large cities of the country. A better quality of building material is exacted, and it is significant that there have never been collapses of buildings in Baltimore. There seems to be an entire willingness on the part of the public to co-operate with the inspectors in carrying out all reasonable provisions, as indicated in the fact that no appeals have been made from the decisions of the present Inspector of Buildings during the three years he has been in office.

In important business buildings there is a great deal of steel construction, with wire-glass windows and terra cotta or concrete slabs for floors. The

lessons of the big fire as to the best fire-retarding materials have been studied and acted upon.

Among the new buildings which have been constructed since the fire are a large number of expensive office buildings, hotels, stores, banks, etc., nearly all of which are of an improved and very pleasing style of architecture, giving to the rebuilt portions of the business section of Baltimore a more attractive appearance than would have been possible had the conflagration never occurred. While it is true that the losses by the great fire put a tremendous strain on the resources and energies of Baltimore, yet it would seem that the necessity for a new standard of activity which fire conditions created started Baltimore on an era of such tremendously energized activities that effects are seen today in the practical rebirth of Baltimore, which it might have taken a long number of years to bring about had not the city been shocked into the greatest possible efforts by the exigencies of the fire.

Suburban building activities are an interesting feature of this decade, and an influence on architectural standards and home construction has been in evidence through the type of homes built at Guilford and Roland Park by the Roland Park Company.

A number of strikingly beautiful structures have been erected in the past ten years for public and semi-public purposes. Especially notable are the plans being worked out for a very comprehensive development in the way of schools and churches in the vicinity of the new Johns Hopkins University on North Charles street.

A summary of the building permits issued from January 1, 1904, to July 31, 1914, as taken from the books of the city Inspector of Buildings, is as follows:

Description.	No.	Cost.
Churches and church property.....	105	\$2,021,848 00
Banks.....	22	1,408,366 00
Hotels and apartment-houses.....	95	5,490,592 00
Office buildings.....	52	9,218,050 00
Stores, warehouses and manufactories.....	1,710	29,658,080 00
Dwellings.....	23,694	38,907,121 00
Hospitals.....	38	2,000,756 00
Schools and universities, public and private.....	65	3,523,815 23
Miscellaneous buildings, improvements, additions, alterations, etc.....	36,669	15,067,044 45
		\$107,295,672 68
Add 20 per cent. for undervaluation as officially estimated by city authorities.....		21,459,134 54
Sundry permits.....	317,325	40,094,250 69
Total.....		\$168,849,057 91



THE CITY HALL OF BALTIMORE



THE UNITED STATES POSTOFFICE

A \$10,000,000 group of Municipal and Government Buildings, which take a prominent place in Baltimore's comprehensive plan for a city beautiful. The City Hall has the unique distinction of having been built for less than the amount appropriated for it, the balance having been turned back into the city treasury.



THE UNITED STATES CUSTOM-HOUSE



BALTIMORE'S COURTHOUSE

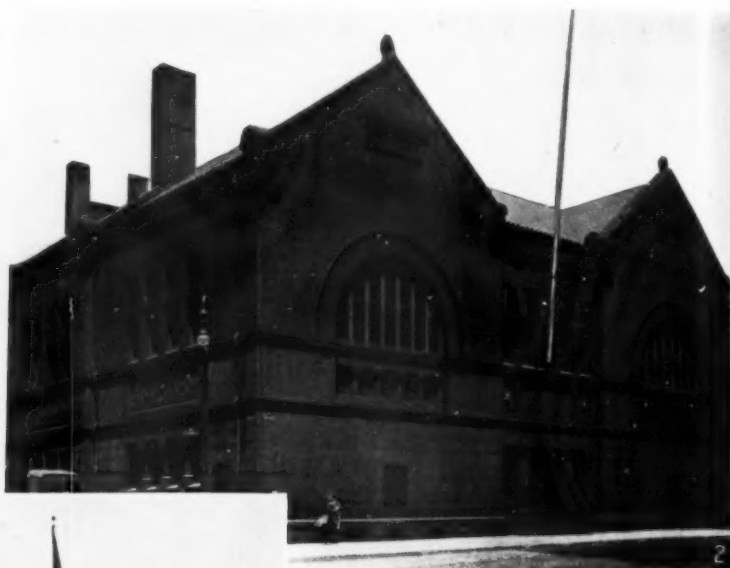
The simplicity and dignity of these structures are typical of the architectural excellence of Baltimore's Public Buildings. Some of these buildings, especially the Court House and the Postoffice, are in the immediate vicinity of many of the largest business structures in the city. The Custom House is in part on the site of the building in which 33 years ago the Manufacturers Record was started and the Custom House and the Manufacturers Record's present building are separated only by a beautiful grass plot maintained by the National Government.



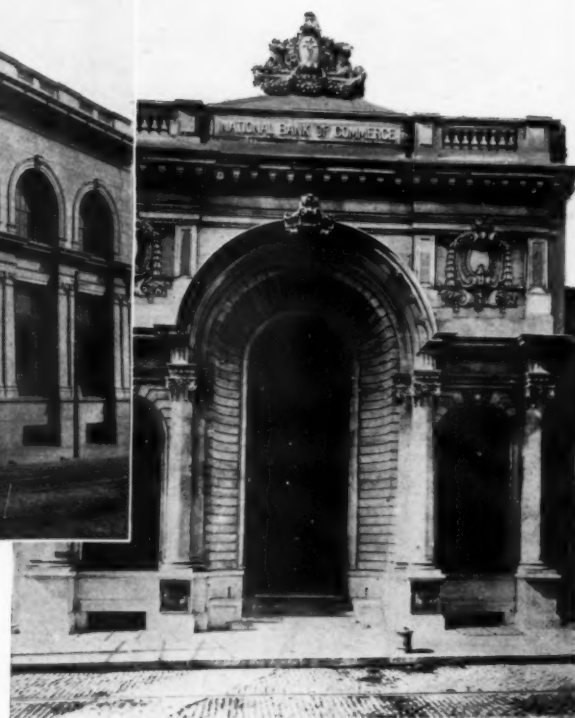
VIEWS OF BALTIMORE'S BUSINESS DISTRICT, "THE CANYONS OF COMMERCE"



BUSINESS STREETS OF BALTIMORE AND THE RISING SKY LINE



3. MERCHANTS-MECHANICS
NATIONAL BANK



2. MERCANTILE TRUST & DEPOSIT CO.
5. NATIONAL BANK OF COMMERCE
7. SAVINGS BANK OF BALTIMORE

1. SAFE DEPOSIT & TRUST CO.
4. CENTRAL SAVINGS BANK
6. EUTAW SAVINGS BANK



A FEW EXAMPLES OF BALTIMORE BANKING HOUSES; THEY TYPIFY THE STRENGTH OF BALTIMORE'S FINANCES

\$400,000,000 of Baltimore Capital Invested in the South

Widespread and Diversified Operations of Baltimore Money

BALTIMORE is the financial headquarters of the South. For nearly fifty years this city has held that position and it will continue to occupy it indefinitely, this dominance being sustained by numerous evidences in a wide distribution of Baltimore capital throughout this section of the country.

Although exact figures as to the amount of Baltimore investments in the South are, in the nature of things, not to be obtained, a careful survey of this extensive field has been made by the Manufacturers Record, and the conclusion drawn, after painstaking comparisons, allowances and deductions for the possibility of duplication of figures here or there, and also after seeking the opinion of conservative men in financial and industrial lines, that there is now, at a low estimate, a total of \$400,000,000 of Baltimore money employed in the South in a great diversity of enterprises and in public works. There is sufficient data to encourage the belief that the total value of Baltimore holdings in the South is more than half a billion of dollars, but, to be upon the safe side, a figure is named which is regarded well within the bounds of fact.

Baltimore was the first city during the period of reconstruction to recognize in a substantial manner the great possibilities existing for those who would undertake the development of the South and its wonderful natural resources. This recognition was primarily in the form of supplying merchants with goods, which they had hitherto been practically unable to obtain even at any price, and to restore the broken and deteriorated railroads to a condition of efficiency. Immediate requirements being met, the reopening of industrial plants began, although slowly and with difficulty, for capital, while willing, was not always to be spared from its lines of service at home. But step by step the restoration was accomplished, and when agriculture, commerce and industry were again established and all were afforded opportunity to grow and prosper, the improvement of the avenues of transportation next occupied the attention of money and resulted in the combination of separate lines into connected and serviceable systems, the predecessors of the great railroads of today.

Thus it was that the Atlantic Coast Line, the Seaboard Air Line and the Southern Railway systems were formed, the latter first as the Virginia Midland and afterwards as the Richmond and West Point Terminal Railway & Warehouse Co. But it was in the first two that Baltimoreans were principally concerned as the initiators and promoters, although other Baltimore capital was heavily interested in the securities of the latter. Indeed at one time the control of the Virginia Midland was held in Baltimore. In the "Coast Line" and the "Seaboard," as they are usually mentioned, the names of Walters, Newcomer, Jenkins, Pratt, McLane, Hoffman, Robinson, Middendorf, Scott and S. D. Warfield are indelibly—respectively and successively—identified with the history and prosperity of the companies. To draw together and firmly weld in harmonious association the many constituent parts of these now extensive systems was a difficult accomplishment, and they were perfected only after years of endeavor and occasional changes of ownership, which sometimes seemed to make acquisition of some particular line almost impossible. But the completed works are evidence of their greatness as well as of the ability of their planners and promoters.

The Baltimore & Ohio Railroad operates to a very large extent in Southern territory, viz., Virginia, West Virginia and Kentucky. Indeed, the center of its activities may be said to be in West Virginia, for it is from that State that it has drawn its enormous coal traffic; and now to its West Virginia coal business is to be added a heavy coal business from Eastern Kentucky, into which the company has built within the last year or two. In the past five years the Baltimore & Ohio has expended upon improvements and extensions about \$100,000,000, and a very large proportion of this has been put into West Virginia and Kentucky. Much of this vast sum has come from Northern and European investors, but primarily Baltimore has been responsible for it, because the Baltimore & Ohio is a Baltimore institution managed in Baltimore, and every step it takes for the development of the Virginias and Kentucky, and every dollar it spends in enlarging its facilities in those States, is directly Baltimore's investment work for Southern upbuilding. A very large amount of Baltimore & Ohio securities, which made possible this Southern work, are held in Baltimore, but we have taken no account of these great sums in aggregating the probable total of Baltimore money in the South.

In the same way the Western Maryland Railroad, which is a Baltimore-managed institution, although the control is not held in this city, has during the last five or six years spent a great many millions of dollars in the extension of its line through West Virginia, through the heart of the coal and timber regions of that State, on to Pittsburgh. Though these millions thus expended have to a limited extent only been provided by Baltimore, as the Western Maryland is controlled elsewhere, Baltimore is primarily responsible for all that has been done in West Virginia by the Western Maryland, for the city of Baltimore itself built the Western Maryland Railroad and owned it for years, selling it out some years ago with the guarantee that the new owners should extend it through West Virginia to the West. As in the case of the Baltimore & Ohio, there is no way of stating how much of this heavy investment in West Virginia, running far into the millions, has been made possible by Baltimore, and, therefore, the investments of the Western Maryland in that State, like the investments of the Baltimore & Ohio in Virginia, West Virginia and Kentucky, are not taken into account in the approximate estimate of \$400,000,000 of Southern money which has been put into the upbuilding of the South.

To realize in concrete shape the dreams of expansion of Southern activities, assemblages of capital were essential, and while at first they were secured

through individual effort and initiative, they were latterly obtained by means of corporate enterprise. In the early eighties the Safe Deposit & Trust Co., one of the big strongholds of Baltimore finance, was the only concern of its kind in the city. Then the Mercantile Trust & Deposit Co. was organized by a strong group of financiers, with John Gill as its president. In its special line of work for Southern development it was a pioneer, and it attained a pre-eminence that it still enjoys. It has been identified with the financing of Southern plans amounting to a total of \$130,000,000 or more, of which it is safe to say 25 per cent., or over \$32,000,000, of stocks and bonds is still held here. These include some twenty or twenty-five railroads, several steamship lines, a number of street railways, gas, water and electric companies, cotton mills and various industries, besides public improvements.

About fifteen or twenty years ago the formation of additional trust companies was actively pushed, including the Baltimore Trust & Guarantee Co. and the International Trust Co., the two afterwards consolidated under the name of the Baltimore Trust Co.; the Maryland Trust Co., the Continental Trust Co., the Union Trust Co., the Colonial Trust Co., the Fidelity Trust Co., and later the Munsey Trust Co., and others. These institutions have been of great value to capital as well as to enterprise, financing propositions of merit and thus discovering employment for otherwise nearly idle money. The Equitable Mortgage & Trust Co. represents another line of work which local capital is doing in the South.

About the same time that the wide development of the trust company idea started the importance of Baltimore as the South's financial center was further demonstrated by the bonding company movement. The success of the Fidelity & Deposit Co., the pioneer institution of this kind in the country, had become so impressive that competition speedily ensued, and soon the United States Fidelity & Guaranty Co. was actively in the field, and it in turn was followed by the American Bonding Co., the United Surety Co. and others. But the first two or three of these corporations established the pre-eminence of Baltimore in the bonding field, and this position will doubtless be maintained indefinitely. Heavily financed, a large part of their resources is invested in Southern securities, so that this money, like the other capital mentioned, is doing a goodly share toward the development of commerce, industry and transportation in the South.

Still another line of insurance effort, the casualty business, is a conspicuous feature of Baltimore's financial growth, and in this the Maryland Casualty Co. has become one of the most conspicuous in the country.

Baltimore's savings banks are also heavy investors in the South, having a total of about \$50,000,000 of Southern securities in their vaults. Among the leaders are the following: Savings Bank of Baltimore, with \$21,344,485 of Southern securities; Eutaw Savings Bank, with \$12,278,805; Central Savings Bank, with \$3,998,500.

In addition to these are the Provident, the Metropolitan, the Hopkins Place and other savings institutions, each of which has Southern securities running up into the millions. Over and above these investments they also have mortgages amounting to \$10,000,000 or more, yet these are not all of their holdings, by many millions.

Impressive as are these figures, which specifically cover numerous investments, they take a secondary position when one considers the great sums occupied with the control of the railroads. In this city the control of the Atlantic Coast Line and of the Louisville & Nashville Railroad is centered. The outstanding capitalization of the former aggregates more than \$217,000,000, which is composed of \$68,755,700 of stock, \$122,624,000 of outstanding bonds and \$25,701,800 of stock and certificates of the Atlantic Coast Line of Connecticut. Thus there is held by Baltimore interests more than 50 per cent. of the stocks, which would mean about \$40,000,000 of Atlantic Coast Line Railroad and about \$13,000,000 of the Connecticut company, besides \$18,706,334 of bonds of the Atlantic Coast Line Railroad in the company's treasury, or an aggregate of approximately \$72,000,000 as Baltimore's share.

This control of the Coast Line also includes control of the Louisville & Nashville, because the first owns 51 per cent. of the capital stock of the latter. The capitalization of the Louisville & Nashville consists of \$71,878,500 of stock; outstanding bonds, etc., \$164,445,339; bonds owned by the company, \$14,155,339, or a total of \$222,168,500. This added to the securities of the Coast Line makes an aggregate of \$455,956,334, which is controlled from Baltimore, together with a combined length of line of more than 12,500 miles, of which 4617 miles are in the Atlantic Coast Line and 7890 miles are in the Louisville & Nashville system.

Yet this summarization of control takes no cognizance of the numerous bonds of the Coast Line which are in Baltimore hands outside of directors and officers of the company. Of the outstanding bonds it is probable that 25 per cent. of them at least, or approximately \$30,000,000 of par value, are owned in this city, and the total may exceed that figure by several millions, for the securities of the system have enjoyed a merited popularity here for years.

In the Seaboard Air Line control is now directed from Baltimore, although not actually owned here in stock. But there is something more than 40 per cent. of the common and 40 per cent. of the preferred shares held in this city, which means a par value of about \$15,000,000 of common stock and \$10,000,000 of preferred stock, or a total of \$25,000,000. In addition to this there are more than 50 per cent. of the Seaboard Air Line Railway first 4 per cent. bonds held here and about 25 per cent. of the adjustment 5 per cent. bonds, which would mean approximately \$7,000,000 of the former and \$6,250,000 of the latter. As for the divisional or underlying bonds of the system, a well-posted

authority says that practically all of them are owned here. They amount to more than \$37,000,000. Even scaling this down liberally to \$30,000,000 would leave a total of Seaboard stock and bonds of very nearly \$70,000,000 in Baltimore.

The complete financial plan of the Seaboard includes \$37,516,000 of common stock outstanding (the total authorized being \$75,000,000) and \$25,000,000 of preferred, besides \$103,000,000 of bonds, the latter being composed of \$12,775,000 of first 4 per cents, \$25,000,000 of adjustable 5s, \$23,800,000 of refunding 4 per cents, \$37,055,000 of underlying bonds, besides notes, equipment trust securities, etc. This makes an aggregate of \$166,146,000 of stock and bonds for which Baltimore energy and enterprise in its beginning of the system is responsible. The Seaboard now has 3082 miles of line.

The Consolidation Coal Co. of Baltimore, which owns and operates extensive mines in Maryland, West Virginia, Pennsylvania and Kentucky, is one of the largest coal-land-owning companies in the world. It has \$25,000,000 of common stock outstanding and nearly \$26,000,000 of bonds, of which latter \$1,479,000 are still in the company's treasury, that also contains \$6,190,500 of stock over and above the amount outstanding for the conversion of \$6,190,500 of convertible bonds already issued and included in the figures here covering the funded debt. While exact data cannot be had, a prominent financial authority familiar with this market, where large quantities of the Consolidation issues have been handled, estimates that about 70 per cent. of the total is held in this city. This would make the figure representing Baltimore interests something over \$35,000,000. This company owns several hundred thousand acres of exceptionally valuable coal land in Kentucky and West Virginia.

The Elkhorn Fuel Co., another great but comparatively new coal-mining corporation, owning about 300,000 acres of coal land in Kentucky and West Virginia, also has its securities liberally owned in Baltimore. They amount to \$30,000,000, par value, and include \$19,000,000 common stock, \$7,000,000 of preferred stock, and \$4,000,000 of first mortgage five-year notes. It is estimated by a banker that approximately \$8,000,000 of all are held in this city. This company owns about \$4,000,000 of stock of the Consolidation Coal Co.

Another great industrial enterprise of the South which has largely drawn upon Baltimore capital and which is dominated here is the Houston Oil Co. of Texas. It has a total of stocks and certificates of a par value of more than \$35,000,000, about \$15,000,000 of which is believed to be held by Baltimoreans. The common stock is \$20,000,000, the preferred stock more than \$8,200,000, and the timber certificates more than \$6,800,000 in the total.

The Monongahela Valley Traction Co., preceded by the Fairmont & Clarksburg Traction Co., whose lines are now one of the properties of the first-named corporation, has from its beginnings commanded the attention and money of Baltimore men. A large proportion of its securities are in the strong-boxes of banks, capitalists and investors here. It has \$5,000,000 of common stock, \$2,500,000 of preferred stock and \$5,000,000 of bonds. That several millions of these issues are held in Baltimore is certain.

Moreover, Baltimore banks always have a large aggregate of their moneys employed in the Southern States. The capital of these commercial institutions amounts to about \$23,500,000, and added to this is their combined surplus and profits of nearly \$33,000,000, or a total of more than \$56,300,000. A considerable part of their \$114,000,000 of loans and discounts is working in the South. They have \$128,000,000 (this includes savings banks) invested in securities, a goodly portion of which are Southern. The Safe Deposit & Trust Co. also holds large amounts of State, city and railroad bonds and other securities of various corporations in the South the value of which runs well up into millions and constitutes a liberal percentage of the gross holdings of financial institutions. Then, the Mercantile Trust & Deposit Co. participated prominently in the financing of a total of about \$130,000,000 of Southern stocks, bonds, etc., since its organization, not to mention the work of other trust companies along like lines. And there are three trust companies of Baltimore which are fiscal agents for \$200,000,000 of securities in the Fifth Banking District alone.

Engaged in the lumber business in the South are several millions of Baltimore cash, the Surry Lumber Co., C. E. James, the E. E. Jackson Lumber Co. and the R. E. Wood Lumber Co. and others having probably about \$5,000,000 or more. A large number of individuals and incorporated companies own timber lands in various parts of the South.

Moreover, Baltimore has some millions of dollars in coal and iron and iron-ore properties other than those already enumerated. The Houston Oil Co., with which Baltimore is so largely identified, owns about 1,000,000 acres of land in Texas; the coal companies controlled in Baltimore own nearly, possibly quite, 1,000,000 acres of coal land, and the timber-owning companies own an aggregate running far into the hundreds of thousands of acres of timber land.

There is also much capital originating here invested in water-power enterprises in the Southern States for the production of electric energy. One man alone has half a million so invested.

These facts all testify to the magnitude of service which Baltimore is giving to the great work of developing the South.

Baltimore has for fifty years taken an active part in the organization and financing of Southern railroads, street railways, electric-light companies and water-works, and has handled a wide variety of State and municipal securities. It is counted the best market for Southern State and municipal bonds, and Baltimore people hold in the aggregate many millions of dollars in such investments. Among the varied list of Southern railways, street railways and other enterprises organized or financed in whole or in part here, or in which Baltimore capital is heavily invested, are the following, which, while not by any means complete, is indicative of the wide range of Baltimore investments in the South. The securities of these concerns are held not only by individuals, by bankers and brokers and large general investors, but by savings banks and other financial institutions in large and small blocks. A study of

the reports of financial institutions who publish in detail a list of their investments shows many blocks of these securities ranging all the way from \$10,000, \$15,000, \$20,000, \$25,000, and on up to \$500,000 or more.

ATLANTIC COAST LINE SYSTEM.

Atlantic Coast Line Railroad.
Wilmington & Weldon Railroad.
Wilmington, Columbia & Augusta Railway.
Richmond & Petersburg Railroad.
Norfolk & Carolina Railway.
Wilmington & Newbern Railroad.
Savannah, Florida & Western Railway.
Alabama Midland Railroad.
Brunswick & Western Railway.
Charleston & Savannah Railroad.
Silver Springs, Ocala & Gulf Railway.
Florida Southern Railway.
Sanford & St. Petersburg Railroad.
Jacksonville & Southwestern Railroad.
South Carolina Pacific Railway.
Charleston & Western Carolina Railway.
Northwestern Railroad of South Carolina.
Atlanta Coast Line of South Carolina.
Northeastern Railroad of South Carolina.
Petersburg Railroad.
Washington & Vandemere Railroad.

SEABOARD AIR LINE SYSTEM.

Seaboard Air Line Railway.
Seaboard & Roanoke Railroad.
Georgia, Carolina & Northern Railroad.
Raleigh & Gaston Railroad.
North & South Carolina Railroad.
Bennettsville & Cheraw Railway.
Raleigh & Augusta Air Line.
Roanoke & Tar River Railroad.
Carolina Central Railway.
Durham & Northern Railroad.
Florida Central & Peninsular Railway.
South Bound Railway.
Georgia & Alabama Railroad.
Florida West Shore Railway.
Savannah & Statesboro Railroad.
Raleigh & Charleston Railroad.
South Georgia & West Coast Railway.

SOUTHERN RAILWAY SYSTEM.

Alabama Central.
Columbia & Greenville.
East Tennessee, Virginia & Georgia.
Georgia Pacific.
Mobile & Birmingham.
Richmond & Danville.
Southern Railway.
Virginia Midland.
Western of North Carolina.
Charlotte, Columbia & Augusta.
Richmond, York River & Chesapeake.
Washington, Ohio & Western.
Atlantic, Tennessee & Ohio.
Knoxville & Ohio.
Charlottesville & Rapidan.
Atlantic & Yadkin.
Georgia Midland.
Richmond & Mecklenburg.
Spartanburg, Union & Columbia.
South Carolina & Georgia.
Blackville, Alston & Newberry.
Sumter & Wateree River.
Atlanta & Charlotte Air Line.
Atlantic & Danville.
Franklin & Pittsylvania.
Roswell Railroad.
Augusta Southern.
Hartwell Railway.
Northern Alabama.
St. Johns River Terminal Railroad.
Alabama Great Southern Railroad.
Belt Railway of Chattanooga.
Mobile & Ohio Railroad.
St. Louis & Cairo.
Mobile & Bay Shore.
Georgia Southern & Florida Railway.
Hawkinsville & Florida Southern Railway.
Cincinnati, New Orleans & Texas Pacific Railway.
Virginia & Southwestern Railway.

CENTRAL OF GEORGIA RAILWAY SYSTEM.

Central Railroad & Banking Co. of Georgia.
Chattanooga, Rome & Southern.
Central of Georgia.
Eatonton Branch Railroad.
Greenville & Newman Railroad.

WESTERN MARYLAND RAILWAY SYSTEM.

Western Maryland Railroad.
Baltimore & Cumberland Valley Railway.
Baltimore & Harrisburg Railway.
Potomac Valley Railroad.
Washington & Franklin Railroad.
West Virginia Central & Pittsburgh Railway.
Piedmont & Cumberland Railroad.
Coal & Iron Railway.

BALTIMORE & OHIO SYSTEM.

Baltimore & Ohio Railroad, prior lien.
West Virginia & Pittsburgh Railway.
Monongahela River Railroad.
Valley Railroad.

OTHER RAILROADS.

Chesapeake & Ohio Railway.
Fort Worth & Denver City Railway.
Florida East Coast Railway.
International & Great Northern Railroad.
St. Louis & San Francisco Railroad.
Kansas City, Fort Scott & Memphis Railway (Frisco System.)
Georgia & Florida Railway.
Louisville & Nashville Railroad.
New Orleans, Mobile & Chicago Railroad.
Missouri, Kansas & Texas Railway.
Norfolk Southern Railroad.
Northern Central Railway (Pennsylvania System.)
Trinity & Brazos Valley Railway.
Norfolk & Western Railway.
Wichita Falls & Northwestern Railway.
Richmond-Washington Company.
Virginian Railway.
St. Louis Southwestern Railway.
St. Louis, Iron Mountain & Southern Railroad.
Texas & Pacific Railway.
Western Railway of Alabama.
Wheeling Terminal.
Macon, Dublin & Savannah Railway.
Atlanta, Knoxville & Northern (Louisville & Nashville.)
Georgia Railroad & Banking Co.
Illinois Central.
Aberdeen & Asheboro.
Texas & New Orleans Railroad.
New York, Philadelphia & Norfolk Railroad.
Galveston, Harrisburg & San Antonio Railroad.
Atlantic & North Carolina Railroad.
Durham & South Carolina Railroad.
Baltimore, Chesapeake & Atlantic Railway.
Coal & Coke Railway.
Albany & Northern Railway.
Aberdeen & West End Railway.
Aberdeen & Rockfish Railway.
Alabama & Vicksburg.

STREET RAILWAYS.

Charleston (S. C.) City Railway.
Norfolk (Va.) Street Railroad.
Charlotte (N. C.) Electric Railway, Light & Power Co.
Roanoke (Va.) Railway & Electric Co.
Goldsboro (N. C.) Traction Co.
Augusta-Aiken Railway & Electric Corp.
Washington (D. C.) Street Railway.
Atlanta Electric Railway.
Augusta Street Railway.
Birmingham Railway & Electric Co.
City & Suburban Railway, Baltimore.
Central Railway, Baltimore.
Chattanooga Electric Railway.
Fairmont & Clarksburg Traction Co.
Memphis Street Railway.
Metropolitan Railway, Washington, D. C.
New Orleans Railway & Light.
Baltimore & Northern Railroad.
Baltimore City Passenger Railway.
Augusta (Ga.) Railway & Electric Co.
City & Suburban Railway, Washington.
Knoxville (Tenn.) Traction.
Anacostia & Potomac River Railway.
Columbia (S. C.) Railway, Gas & Electric.
Lexington (Ky.) Railway.
Monongahela Valley Traction Co.
Norfolk & Portsmouth Traction Co.
Virginia Railway & Power Co.
Savannah Electric Railway.

MISCELLANEOUS.

Consolidated Gas, Electric Light & Power Co., Baltimore, \$350,000.
Henrico County Gas Co., Richmond, Va.
Bluefield (W. Va.) Gas & Power Co.
Sumter (S. C.) Gas & Power Co.

North Carolina Electrical Power Co., Asheville, N. C.
Paducah (Ky.) Water Supply Co.
Charlotte (N. C.) City Water-works Co.
Charlotte Water Co.
Raleigh (N. C.) Water Co.
Manchester (Va.) Water Co.
Charleston (S. C.) Light & Water Co.
Hamlet (N. C.) Water Co.
Harris Springs Water Co., Harris Springs, S. C.
Merchants & Miners Transportation Co.
Baltimore & Carolina Steamship Co.
Ocean Steamship Co.
Bessemer Coal, Iron & Land Co., Bessemer, Ala.
Davy Pocahontas Coal Co., Elkins, W. Va.
R. J. & B. F. Camp, lumber business, Franklin, Va.
Williams & McKeithan Lumber Co., Lynchburg, Va.
Eddy Lake Cypress Co., in Horry County, N. C.

A competent authority estimates that there is altogether approximately \$10,000,000 of Baltimore capital invested in cotton mills and other textile industries in the South. This is deemed a very conservative expression by other careful men in the same line of enterprise. As indicative of Baltimore's identification with Southern cotton manufacturing, Woodward, Baldwin & Co. of Baltimore, who also have offices in New York, are selling agents for the following mills in which Baltimore capital is interested:

Piedmont Manufacturing Co. of Piedmont, S. C.
Loray Mills of Gastonia, N. C.
Enterprise Manufacturing Co. of Augusta, Ga.
Anderson Cotton Mills,
Orr Cotton Mills,
Brogan Mills,
Toxaway Mills, all of Anderson, S. C.
Greenwood Cotton Mills,
Grendel Mills, both of Greenwood, S. C.
Granby Cotton Mills,
Richland Cotton Mills,
Olympia Mills,
Capital City Mills, all of Columbia, S. C.
Victor Manufacturing Co.,
Franklin Mills, both of Greer's, S. C.
F. W. Poe Manufacturing Co.,
The Carolina Mills,
Woodside Cotton Mills,
Judson Mills,
Monaghan Mills,
Brandon Mills, all of Greenville, S. C.
Saxon Mills of Spartanburg, S. C.
Fairfield Cotton Mills of Winnsboro, S. C.
Pickens Mills of Pickens, S. C.
Hermitage Cotton Mills,
Pine Creek Manufacturing Co., both of Camden, S. C.
Easley Cotton Mills,
Glenwood Cotton Mills, both of Easley, S. C.
Beaver Dam Mills of Edgefield, S. C.
Apalachee Mills of Arlington, S. C.
Maplecroft Mills of Liberty, S. C.
Woodruff Cotton Mills of Woodruff, S. C.
Ninety-Six Cotton Mills of Ninety-Six, S. C.
Williamston Mills of Williamston, S. C.
Chiquola Manufacturing Co. of Honea Path, S. C.
Lois Cotton Mills of Douglassville, Ga.
Lydia Cotton Mills of Clinton, S. C.
Ottaray Mills of Union, S. C.
Eureka Cotton Mills,
Wylie Mills, both of Chester, S. C.
The Hartwell Mills of Hartwell, Ga.
Enoree Manufacturing Co. of Enoree, S. C.

Here is a total of forty-two cotton mills with an aggregate of 1,667,376 spindles, whose goods are handled by one Baltimore house. But this is not all, for there are the several plants of the Mount Vernon-Woodberry Cotton Duck Co. in the South, including the Columbia Mills of Columbia, S. C.; the Hogansville (Ga.) Mills, the La Grange (Ga.) Mills and the Tallassee Falls Manufacturing Co. of Tallassee, Ala., and many others in which some Baltimore capital is represented. This is illustrated in the fact that there are a dozen mills in the following list in the financing or establishment of which the Mercantile Trust Co. of this city participated:

Proximity Manufacturing Co., Greensboro, N. C.
Revolution Cotton Mills Co., Greensboro, N. C.
Minneola Manufacturing Co., Gibsonville, N. C.
Manetta Mills, Lando, S. C.
Union Manufacturing & Power Co., Union, S. C.
Holt Morgan Mills Co., Fayetteville, N. C.
Mascot Mills Co., Sweetwater, Tenn.
Harborough Co., Bessemer City, N. C.
Leakesville Cotton Mills Co., Leakesville, N. C.
Washington Mills, Fries, Va.
Trion Manufacturing Co., Trion, Ga.
Clayton Cotton Mills, Clayton, N. C.

Educational Activities in Which Baltimore Leads

AT the close of the 1913-14 season of the Conservatory of Music of the Peabody Institute, in the presence of as representative a body of citizens from every walk of life valuable to the community as had ever been assembled in Baltimore, diplomas were given to eight young men and women and teachers' certificates to thirty-one others. The diplomas testified to several years' successful work in piano, violin or organ under the enthusiastic and conscientious guidance of as gifted a corps of teachers as may be found in any similar institution on this side of the Atlantic. The certificates marked a stage of progress under similar auspices. It was rather significant that the young man who received the first diploma of the institution given for the violin had but a few years before been living in his native land, one of the European countries now convulsed by war, that a piano diplomatist was still in his minority and that the girl who made the highest average in the award of the teachers' certificates is blind. This function is worthy of note in any consideration of the educational assets of Baltimore, and naturally leads because appreciation of music is, perhaps, the highest expression of human culture and because the Peabody Institute, with its great library, its music, its literary relaxations and its association with the plastic and graphic arts designed to be brought into touch with the average citizen, was one of the earliest exponents of culture. For years its lecture courses were dominant in such means of popular education, and its library, mainly one for reference work, was made specially accessible to students of the Johns Hopkins University when that foundation was formally opened in the fall of 1876 in a made-over residence in the heart of the city.

Within a few weeks some of the work of the Johns Hopkins will be underway in its beautiful new location at Homewood, where ere-long all its departments of science and philosophy will be housed in the truly academic groves which have been lacking thus far from its equipment.

At the outset it was decided by the authorities of the institution that mere duplication of collegiate ideas already established should be avoided and that special emphasis should be laid upon post-graduate work leading to the degree of Doctor of Philosophy, the plan as it worked out taking the form of a modification of the German university idea, with leadership in research going hand-in-hand with instruction by class lectures, training in laboratory investigations and interchange of thought in seminars. Presently undergraduate curricula were arranged upon the elective system leading to the degree of Bachelor of Arts, and the opening of the Johns Hopkins Hospital in 1889 was followed in a few years by the natural evolution of a medical school that is the ranking one in this country and has been one of the influences giving world-wide fame to the attractions of Baltimore through the Johns Hopkins University.

The nucleus of the post-graduate phase of the university was created through the system of fellowships awarded each year, placing a number of selected men beyond the necessity to earn a livelihood while carrying on research work in divers domains. These Fellows came from Europe, Asia, America and the isles of the seas, and gave from the start an air of cosmopolitanism to the institution while carrying its name to distant and widely-separated parts of the world. They also set the pace for hard, patient work, often bringing brilliant results, which even many undergraduates emulated in the comparative absence of the social and athletic beguilements which characterize so much of the conventional college life. Scholarship thus cultivated soon found vent in important contributions to science and the humanities, and the university hall-mark was placed upon such standard periodicals as *Studies in Historical and Political Science*, *The American Journal of Mathematics*, *Studies from the Biological Laboratory*, *The American Chemical Journal*, *Modern Language Notes*, *Contributions to Assyriology* and *the American Journal of Philology*. By force of example as a pioneer and by the direct influence of hundreds of its graduates in positions of teachers and administrators, the university has been a mighty factor in giving distinction to the university idea in this country and in making the academic degree an indisputable record of attainment in

scholarship. Men trained within its walls have gained position of importance in the administration of national affairs, Woodrow Wilson being the most shining mark, and one of its most flourishing local alumni associations is composed principally of men active in the scientific work of the Government at Washington. At the same time members of its faculty have taken a direct, personal interest in all that works for the betterment of Baltimore. The name of Brooks will always be associated with Maryland oysters and their conservation; Welch could make time serving on the city charter commission; Gilman was found in the school board, and Clark was the real creator of a model State geological survey.

When the Hopkins was organized there were in active and useful life two schools, medical and law, of the University of Maryland, to which were soon added a dental department and one of pharmacy. Other professional schools are the College of Physicians and Surgeons, the Baltimore Medical College and the Baltimore College of Dental Surgery, the first college of the kind to be established. Many of these colleges, together with hospitals not directly connected with them, have become training schools for professional nurses.

Goucher College, started as the Woman's College of the Methodist Church, has been sending forth its graduates for twenty-two years and has become another center of higher education for the country. Like most of the other institutions of its class, its home is within the limits of the city, but it was so planned as to its physical proportions that it has created its own atmosphere in the northern section of the city.

Loyola College, under administration of the Jesuits, and St. Mary's Seminary of St. Sulpice, training men for the Roman priesthood, are also in Baltimore.

A well-organized public school system, topped by a City College, three High Schools, a Teachers' Training-School, distinct from the State Normal, and a Polytechnic Institute, to-

gether with a number of private schools, including two or three preparatory schools, round out the conventional educational institutions of the city.

Supplementing them are the Maryland Institute for the Promotion of the Mechanic Arts, an enterprise of nearly seventy years' activity; the Enoch Pratt Free Library, with numerous branches; the Maryland Historical Society, the Maryland Academy of Sciences, the Charcoal Club and Walters Art Gallery. A popular library, involving membership dues, the Mercantile; the Stinnecke Episcopal Library of the Diocese of Maryland, collected during the lifetime of Bishop Whittingham; the Bar Library, the Odd-Fellows' Library and the valuable and interesting collection made by the City Librarian of the past few years in the City Hall contain some of the quite half million volumes readily accessible for the citizens of Baltimore. These educational opportunities, thus briefly sketched, are not the least among the advantages of Baltimore. They account for much of the attractiveness of life here, and they call, directly and indirectly, to a far greater population than the city could contain.



MARYLAND INSTITUTE FOR THE PROMOTION OF MECHANIC ARTS



MILLION-DOLLAR POLYTECHNIC SCHOOL, A BRANCH OF BALTIMORE'S PUBLIC SCHOOL SYSTEM



GILMAN HALL (LEFT) AND MECHANICAL AND ELECTRICAL ENGINEERING BUILDING (RIGHT)—FIRST TWO OF THE GROUP OF BUILDINGS TO BE ERECTED AT HOMEWOOD, THE NEW SITE OF JOHNS HOPKINS UNIVERSITY



GOUCHER COLLEGE, ONE OF THE COUNTRY'S LEADING COLLEGES FOR WOMEN



EASTERN FEMALE HIGH SCHOOL, REPRESENTING THE LATEST IDEAS IN SCHOOL ARCHITECTURE



WESTERN FEMALE HIGH SCHOOL, TO WHICH A \$178,000 ADDITION WAS RECENTLY COMPLETED



GILMAN COUNTRY SCHOOL FOR BOYS, A NOTABLE ADDITION TO BALTIMORE'S EDUCATIONAL FACILITIES

Work of Baltimore's Harbor Board

By OSCAR F. LACKEY, Member A. S. C. E., Harbor Engineer.

THE Harbor Board was established in 1876 to take care of all affairs connected with the harbor.

In 1914 the public work in charge of the Board includes harbor maintenance and improvement, control of the iceboats, the general care of all wharves and bulkheads and city bridges over navigable waters, the supervision of anchorages, the disposal of ashes from towboats, the removal of unsanitary floating matter from the harbor, and, as occasion may require, the removal of sunken vessels.

The early reports of the Harbor Board show that in 1875 the city had no harbor to meet the needs of modern commerce. Its waterways were shallow, shoaly and tortuous. Since that time the work of improvement has gone on annually. The size of vessels has increased from year to year until now a depth of 35 feet is required, and the National Government has provided a main channel of that depth with the understanding that Baltimore will deepen the main harbor and the channels to the various ocean steamer piers to meet this.

Even with its present facilities the following comparison will show

how its commerce has grown to the magnitude that establishes Baltimore as one of the great ports of the world.

Vessels of the Earn Line show an increased deadweight lifting capacity of 30 per cent. in the past ten years.

Vessels of the Holland-America Line have doubled in gross tonnage in the same period.

The largest vessel of the Hamburg-American Line that came to Baltimore ten years ago was 7500 tons gross register, while the largest one of recent entrance was nearly 14,500 gross tons.

From 1876 to 1914 the Harbor Board has paid out to contractors for dredging the harbor \$1,782,725.

Baltimore's system of public wharves and docks, recently completed with the outlay for two sections of the waterfront street, will represent a cost of about \$7,250,000.

The waterfront terminals of the railroads may briefly be stated as follows:

The Locust Point terminal of the Baltimore & Ohio Railroad Co. is the largest on the Atlantic seaboard. There millions of tons of freight are

imported and exported annually and thousands of immigrants landed each year. The terminal covers a mile of waterfront and is well appointed with a system of spacious docks, large freight and coal piers and mammoth grain elevators with capacity of two and one-half million bushels.

Equally well situated in Baltimore harbor, the Pennsylvania Railroad through its connections handles a vast traffic over a dozen enormous piers, and also has storage capacity for two and one-half million bushels of grain.

The Western Maryland Railroad Co. has every facility for prompt handling of shipments at its Port Covington terminal, where it has storage capacity for two thousand freight cars.

The Canton Company and Canton Railroad owns a large waterfront partly improved with two or three large piers and a six-story warehouse, and has under contract the deepening of the water from the main ship channel to its waterfront so as to permit ships of 35-foot draft to dock at its piers. It has connections by Canton Railroad, eight miles long, with the Baltimore & Ohio, Pennsylvania and the Western Maryland Railway Co.

It becomes most opportune now to consider what the future holds out to Baltimore. Those who have given mature thought to the subject foresee a vast volume of trade to be taken care of by way of the Panama Canal, and it would seem to be the part of wise action for Baltimore to be prepared to



VIEW OF INNER HARBOR, SHOWING MUNICIPAL DOCKS UPON WHICH \$7,000,000 HAVE BEEN EXPENDED

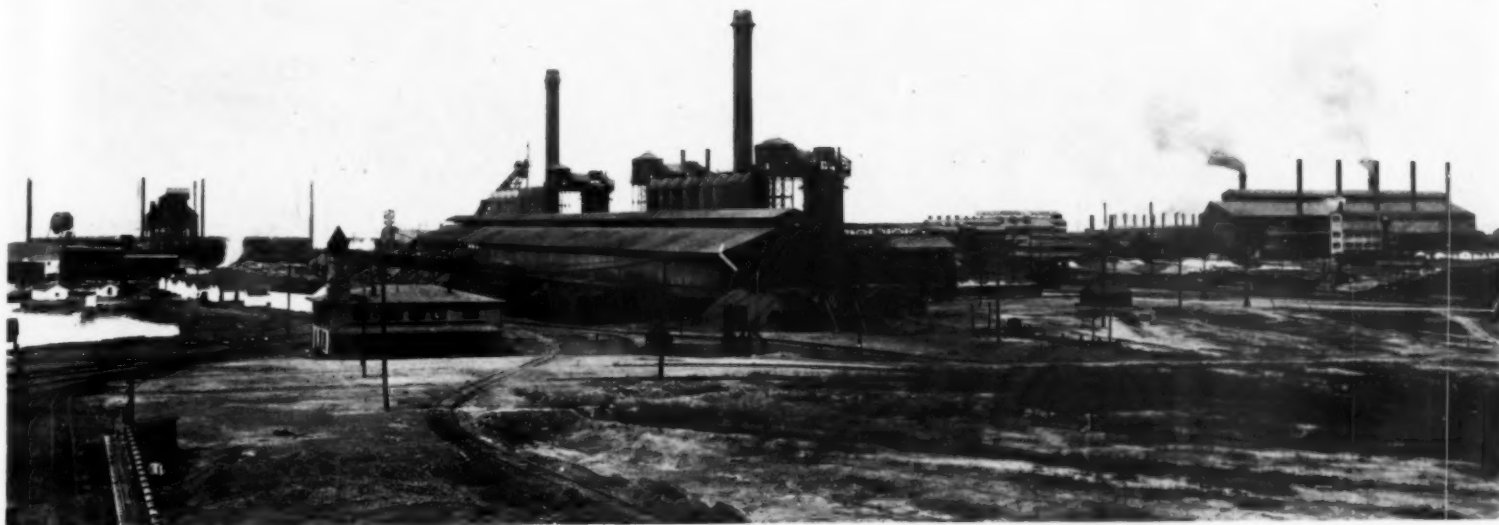
The following table shows the waterfront adjacent to the channel approaches of Baltimore, all of which is open to development by industries needing bold water in front, high and healthy surroundings, with railroad connections and trolley service close by:

Waterfront Patapsco River and Tributaries.

	Statute Miles.
Northwest Branch (main harbor)—	
Front feet of wharf room (1913) 145,700 feet.....	27¾
Main and Middle Branches—	
Light Street Bridge to Fort McHenry.....	2¼
Light Street Bridge to Old Quarantine.....	3
Spring Gardens (Middle Branch).....	4¼
Patapsco River, South Shore—	
Old Quarantine to Bodkin Point.....	12¼
Curtis Creek.....	16½
Stoney Creek.....	8
Rock Creek.....	6
Bodkin Creek.....	8
Patapsco River, North Shore—	
Lazaretto to North Point.....	10½
Colgate Creek.....	2
Bear Creek.....	19½
	120



THE UPPER END OF BALTIMORE'S HARBOR, SHOWING PROXIMITY OF BUSINESS CENTER



PLANT OF MARYLAND STEEL CO., LOOKING FROM LAND SIDE TOWARD WATER; THE LARGEST STEEL PLANT ON TIDEWATER IN AMERICA

handle such trade when it comes. Other ports are making such provision. The Pacific ports are spending millions in anticipation of the Panama trade, and most of the Atlantic ports are making large preparations to

open arms will bid it welcome. Now is the time for Baltimore to take advantage of the position it occupies of being nearer to the source and destination of much of the interocean trade by making provision at once for the additional



SCENE ON LIGHT-STREET WHARF, WHERE MILLIONS OF BARRELS AND BOXES OF FRUITS AND VEGETABLES ARE ANNUALLY HANDLED

secure a good share of the vast commerce soon to pass through the new canal. As coming events cast their shadows before, so now Baltimore feels the onrushing prosperity soon to knock at its portals for entrance and with wide



A MILLION-DOLLAR RECREATION PIER PROVIDED BY THE CITY OF BALTIMORE—LOWER FLOOR USED FOR BUSINESS

piers and docks needed to take care of the flood tide of commerce which can be made to sweep back and forth from our port on through the Panama Canal, leaving in its wake much wealth for the people of Baltimore.



DAVISON CHEMICAL CO. SULPHURIC-ACID PLANT, SAID TO BE THE LARGEST IN THE WORLD

The All-Compelling All-Around Advantages of Baltimore

By ALBERT PHENIS

BALTIMORE should become the second greatest port in the United States, because it is the nearest port on the Atlantic seaboard to Buffalo, Pittsburgh, Chicago, St. Louis and others. Thus a large portion of the most productive and most highly developed section, industrially, in America gets cheaper railroad rates through Baltimore than through any other Atlantic port. It is also the natural trading center for the great Piedmont and Appalachian Mountain section, extending from New York to Alabama, in the full development of which prophets have foretold that Baltimore would be benefited to so vast an extent as to make her the future great city of the Atlantic coast.

In any event, and should there not be complete realization of this dream in its widest extent, Baltimore should become one of the greatest industrial centers in the United States, because it has the prime qualification for profitable manufacturing, to wit: it is a place where raw materials can be cheaply and conveniently assembled and manufactured products distributed at low cost to the points of greatest consumption. Also, of hardly secondary importance, it is a place where labor is abundant, well conditioned and contented. Experts in industrial development have reckoned this as the one supreme advantage Baltimore possesses. Among the great cities of the country Baltimore is known as the paradise of the small income. The enterprise of the builder and real estate operator, the homestead associations and the operations of the redeemable ground rent plan have made it possible for any one, with an income ever so small, to own a home. Tenements are almost unknown, and such as are here are of more inviting form than those ordinarily found. But the demand of the Baltimore working man is for an individual home, a house unshared with others, and such homes are found here by the tens of thousands.

The many parks the city owns, where there are concerts throughout the summer and playgrounds for children; the shore and suburban resorts, reached by trolley line or boat; the pleasant retreats in the nearby mountains and the charming excursion places all along the bay, afford opportunities to all for recreation and delight, with a selection to be made in accordance with any purse.

Then the markets of Baltimore are noted throughout the world. From the waters of the Chesapeake come fish, oysters and crabs that are famously fine. All down the shore are truck gardens that send a daily supply of vegetables, always the freshest and the best. All around are orchards, whose peaches, apples and other fruits are unsurpassed, and in every line the markets are abundantly supplied, mostly with foodstuffs that are grown by farmers and gardeners near at hand. Every epicure knows of the canvas-backs and terrapin of the Chesapeake, and well appraises the supremacy of the Old Virginia ham. Nowhere can choicer or more costly viands be obtained, but side by side in the markets here will be found the luxuries of the rich with the plainer staples the average family demands. There are nearby poultry farms and dairies, and nowhere is there a more abundant supply of the finest butter, milk and cream. More good things can be had in Baltimore for less money than in any other city of its size in the land.

Those familiar with conditions in and surrounding the cities of America recognize the numerous important advantages over all that Baltimore has. Historically and socially it is a place of distinction, and it has as its neighbors many of the more important cities of the nation, including the metropolis and the capital. Territory to be reached in 24 hours and less contains over half the population of the United States, so that its location is a convenient as well as an agreeable one.

The citizenship of Baltimore has always been distinguished. Since early times Baltimore has led in enterprises of numerous important kinds, and in the present day there has been developed a spirit of aroused aggressiveness which, with the rock-bottomed conservatism that has always kept Baltimore within the ranks of the solvent and the sane, promises the broadest development along eminently practical lines. With the vast expansion of Southern trade, commerce and industrial development, it is required of Baltimore that the completest facilities be provided here. Baltimore always has been the metropolis of the South, her strongest, richest city, and it is in evidence that the people here are preparing to meet their greatly enlarged obligations in a fully adequate way. These preparations have in view not only the necessities created by the expanding South, but include the obligations put upon every American trading center by the Panama Canal construction and the present elimination of Europe from the commerce of the South American nations.

In addition to trade and commerce, by rail and sea, there should be a continuous advance in manufacturing here. If no other advantage were present, the attractiveness of Baltimore as a place to live, appealing to every one alike, should be occasion enough, for conditions have already attracted an extraordinarily large population of well conditioned, contented, home-loving working people, the backbone of all industrial development. Also, there are physical conditions here which make it possible to expand the city in every direction, except on the waters of the bay. I know of no city in America (and I know something of all) with such a combination of geographical location, rail and water transportation, attractiveness as a place to live, and with practically unlimited territory in all directions in which to duplicate and reduplicate sites for factories, workmen's homes, etc., and at the same time preserve an area of suburban development and magnificent country estates of such varied and imposing grandeur as to remind the traveler of the finest estates of rural England. In all directions, except along the bay, there is a succession of hill and valley, and skirting the city, on the north, east and west, for miles in

extent, one after the other, there are most superb developments of picturesquely located country homes. With a developed area for business purposes covering many times the space now occupied by Baltimore's urban area, there would still be opportunity in the country beyond for new suburban and country homes, and some day there will be attention paid as never up to now to the opportunities for making extensive use for residence purposes of the country overlooking the bay.

Baltimore is a city of such varied charms that it makes an appeal to every type of man, and to none more than to those of the greatest culture and refinement. There is a quality of daintiness about Baltimore, a seeming as of something peculiarly and distinctively fine. Her "Southernness," as it has been called, invests her with distinguishing graciousness among all the larger cities of the land, while none of the lesser, more sequestered places of the farther South have an atmosphere of greater charm. It is this spirit, or soul, of Baltimore that not only binds to her the affections of her own people, but wins the admiring regard of those beyond her gates who come to know her well.

Baltimore has been beautiful always, with her pleasing setting of bay and stream, valley and height, with dense woodlands wherever the hand of man has been staid, and with her well-paved streets and boulevards, connecting a chain of splendid parks, the Baltimore of the future will challenge the admiration of the world. When the great work of paving every street and alley in Baltimore has been entirely completed, no city in the country will be better provided with good streets. Even at the present time the streets finished within the city and the good roads in the suburbs give opportunities for delightful trips in any direction. The succession of hill and valley, with charming country homes to be found to the east, north and west of Baltimore, is reached by a series of well-constructed and well-maintained roads at the present time, so that the visitor may motor for days and weeks amid the most delightful scenery to be found in the vicinity of any large city, either here or abroad. When all the paving work is done, Baltimore will be noted as a city of magnificent streets and unparalleled beauty of surrounding scenery.

But beyond her beauty and her comfortableness, her perfect ministrations to the demands of the gourmand and the gourmet—for Baltimore has long been famed as the gastronomic center of America—the strong appeal of Baltimore has been to the spirit and the intellect. This is a city of churches, and the community is deeply imbued with religious feeling. It is a city of schools and of artistic taste, as evidenced by the great Johns Hopkins University and others, and the Peabody Institute and the Walters Art Gallery. It is a city in which ministers love to dwell, and to which they longingly look when called to go elsewhere. It is a place where every father of a family rejoices to live, that his children may have the advantages of the schools and the atmosphere of refinement and good breeding that everywhere prevails.

Every investigator sees that Baltimore has possibilities for an all-round development far beyond anything that has occurred. Some bolder prophets have foretold a future of transcendent greatness, and among prophecies of such kind there is one so graphic and so cogent that it is here reproduced. It is from the pen of one who twenty years ago sketched a vision of the Baltimore that is to be, a man who knew the South and believed in it, and whose faith in Baltimore is thus expressed:

"The Blue Ridge, which forms the eastern wall of the Appalachian ranges, approaches the Atlantic coast as it runs northward. It is unbroken and a watershed up into Central Virginia, and only cut to its base by the Potomac and the Susquehanna. The western coal-bearing ranges widen out to meet the upper Ohio and the mountain country, and at the parallel of Baltimore the mountain country is from 250 to 300 miles across, the rivers flowing to the Atlantic via Chesapeake Bay rising on the westerly ridges and cutting through the eastern ranges. This fact, and the deep indentation of the Atlantic coast by Chesapeake Bay, bring the mountain country and tidewater almost together at the head of the bay at Baltimore. This topography of the mountains and the peculiar conformation of the coast line make Baltimore the key to that part of the mountain country lying between the Susquehanna and the head of the rivers which flow southward through the valley of East Tennessee, and Baltimore's lines of railway across the mountains to the Lake and Ohio Valley States, aside from running through the widest part of the mountain region to the south, and the part richest in minerals and forests, are shorter than those which connect the Central Northern States with Philadelphia, New York or the New England cities. Baltimore can be, and should be, to Southern development what New York has been to the upbuilding of the West. Baltimore has a larger field of wealth to draw from, and a more permanent field, than New York and New England had in their western territory, and the topography of Baltimore's field converges and concentrates it upon her much more than the West converges on New York. In fact, the short and natural lines between the West and the Atlantic converge on Baltimore. All these facts must ultimately make your city the great city of the Atlantic coast.

"The only one field in America which has made no advance commensurate with the general advance of the country at large, and none worth considering when its incomparable natural wealth is taken into account, is the mountainous portion of the States of Pennsylvania, Maryland, a little of Ohio, the Virginias, the Carolinas, Kentucky, Tennessee, Alabama and Georgia. Here is the greatest natural storehouse and workshop on the face of the earth. In this area of perhaps 140,000 square miles is at least thirty times the natural wealth

of Great Britain, and more than ten times the natural wealth that can be found in any other solid body of like area anywhere on the face of the earth. In European countries are little patches of like country, but in no way to be compared for natural wealth, square mile for square mile, on which populations are crowded together, who for generations past have lived prosperously, and where for centuries to come prosperity will continue, in numbers so great that if the entire population of the United States today were crowded into this mountainous region of ours it would not be nearly so closely taken up; while around this mountain country lie Eastern Pennsylvania and New Jersey, Maryland and Delaware, the Piedmont and Tidewater counties of Virginia, the Carolinas and Georgia, the Gulf States east of the Mississippi, Tennessee and Kentucky, out to the 'Father of Waters,' and the rich States along the north bank of the Ohio.

"Here in the center of this empire is piled up natural wealth enough to enrich a continent and to furnish in perpetuity profitable work for scores of millions of people. Here is a guarantee which nature has given of work for those in the center in producing wealth to exchange with the territory adjoining. Here is a field for a home market that will forever endure and grow. It would take too long to show how the peculiar topography of this country concentrates its wealth along certain lines, and how from this topography Baltimore is the key to the upper half of it; further, how her railway connections and her natural lines sweep back to Lakes Ontario and Erie and into the heart of the Central Northern States far better than do the railways and natural lines of New York and Philadelphia. But in the mountain country alone is a field of wealth, the production of which must focus on Baltimore, which must inevitably make her the future great city of the Atlantic coast in population, wealth and prosperity."

Some Baltimore Facts Briefly Stated

BALTIMORE has the best food at the lowest prices of any city in the United States, according to the report of the Congressional committee on the high cost of living.

About 5,500,000 bushels of oysters are taken yearly from Maryland waters.

Population 1910 (United States census), 558,485. About 700,000 people live within seven miles of the City Hall.

The Baltimore & Ohio, Pennsylvania, Western Maryland, Maryland & Pennsylvania roads operate through the city of Baltimore; by traffic agreement, also the Southern, Chesapeake & Ohio, Seaboard Air Line, Atlantic Coast Line, and Norfolk & Western.

Thirty-four steamboat and steamship lines in domestic and foreign trade. In the Chesapeake Bay and coastwise trade there are about 13,000 craft of all kinds engaged.

The value of Baltimore's water-borne traffic passing over the wharves and piers of this city is nearly \$450,000,000 a year.

The Baltimore & Ohio and the Western Maryland railroads, with tidewater terminals at Baltimore, tap the heart of the world's best coal fields.

The value of exports and imports at Baltimore was \$166,000,000 in 1913.

Baltimore is the center of the cotton-duck industry of the world.

The largest iron and steel plant on tidewater in the United States fronts Baltimore's harbor, representing a capitalization of millions and producing

iron and steel, and including a steel rail mill and an immense shipyard, one of the largest in the country.

In Baltimore is held the control of the largest bodies of coal lands owned in this country, if not in the world.

A Baltimore sulphuric-acid plant is said to be the largest in the world.

Baltimore's Johns Hopkins University is one of the foremost universities in America, and was the pioneer in this country in higher educational work.

Baltimore is the foremost medical and hospital center in America.

Baltimore is a city of churches, and is credited with a closer observance of the Sabbath than any other large city in the United States.

Baltimore has a single suburban development covering 1000 acres of land, which for land, buildings and improvements will represent an ultimate outlay of \$40,000,000.

Baltimore manufactures \$36,000,000 of men's clothing, or one-half of the total output for the 16 Southern States.

Baltimore has the largest tin-decorating plant in the world, employing 1500 hands.

Baltimore exports over \$40,000,000 of refined copper, a part of the output of the largest plant of the kind in the world, located in Baltimore.

Baltimore has the largest plant in the world manufacturing bottle-sealing devices and stoppers, covering many acres of ground.

Things That Baltimore Did First

Birthplace of the National Anthem—"The Star-Spangled Banner."

Reared first monument to George Washington.

First American railroad was chartered—The Baltimore & Ohio.

First patent for locomotive granted.

First ribbon of American silk was made.

First steam engine for traction purposes operated.

First steam vessel entirely of iron constructed.

First telegraph line operated (over Baltimore & Ohio Railroad.)

First iron building erected.

First revolving printing press made.

First armor plate made.

First electric car operated.

First electric locomotive used by a railroad (Baltimore & Ohio.)

First linotype machine made.

First carburetted hydrogen gas for city illuminating made.

First Merchants Exchange erected.

First to create the bonding business and is bonding center of the world.

First submarine iron vessel—the "Winan's cigar-boat"—was built at Baltimore.

Largest floating drydock in the world—the Dewey—constructed.

The first dental college in the world was established in Baltimore.

Baltimore was the first city in the country to import Peruvian guano.

A Baltimorean discovered the deposits of phosphatic guano in the West Indies and first brought it to this country.

Hermetically sealing of oysters was first done in Baltimore.

Peter Cooper of New York, spending a few years in Baltimore, made the first Baltimore charcoal iron from local ore.



FRONT VIEW OF JOHNS HOPKINS HOSPITAL, THE MOST NOTED IN AMERICA—NEWEST AND LARGEST BUILDINGS, IN REAR, DO NOT SHOW IN THIS PICTURE

Railroads As Upbuilders of Baltimore

By SAMUEL G. WILMER.

IN the magnitude and effectiveness of its railroad facilities Baltimore stands in the front rank of seaports. She was long the terminal of two great trunk lines, and recently added a third, so that her abilities in the handling of freights and passengers in trans-oceanic traffic have been extensively expanded in addition to the natural growth of the older systems. Her railroad capacity for domestic traffic has also been commensurately enlarged, and the several stations, yards, warehouses, docks, piers, etc., all bear witness to the marvelous advance which the transportation companies have made in their provision for increasing business. Millions of dollars have been spent, and the completed works, if railroads and their terminal facilities can ever be called completed, stand as monuments to the men whose broad vision and wise discernment initiated them.

First in the history of railroad transportation at Baltimore stands the Baltimore & Ohio Railroad, and the impressive bulk of its accomplishments here speaks forcefully of what it has achieved in the eighty-eight years of its life. Since 1909 the company has spent \$100,000,000 for new construction, betterments and new equipment, a large amount of which great sum was for work at Baltimore. Going back several years there were other heavy expenditures made upon its property here, so that the total cost of work which it has done in late years at this city approximates \$30,000,000. This includes the construction of the Belt Line Railroad, which necessitated the boring of a double-tracked tunnel under the heart of the city for a mile and a half and the building of six miles more of two-track line to connect Camden Station with the previously used line at Bayview Junction, the old route having been worked by the use of steamers in ferrying trains between Locust Point and Canton. This connecting road cost about \$7,000,000, or well up toward \$1,000,000 per mile. It is operated with electric locomotives, the first for heavy traffic in this country. The company has also built merchandise piers costing more than \$2,500,000 and with a floor space of 1,218,900 square feet, four coal piers with 28 chutes for harbor business, and one coal pier with 50 chutes for export and coastwise business, this latter having a capacity of 15,000 tons per twelve-hour day. It cost \$500,000, and it is having plans made for another, which it is said will be the

best in the world. The Camden Warehouses, erected a few years ago, have a floor space of 450,000 square feet and cost \$581,804; the Henderson Wharf warehouse has 300,000 square feet floor space and cost \$230,736. Then there are the two big grain elevators at Locust Point, which cost \$653,439 and \$840,481, respectively, the former having a working capacity of 1,200,000 bushels and the latter of 1,300,000 bushels. At Mount Clare yards is a third elevator with 250,000 bushels capacity, this for local business. It cost \$213,267.

In its new office building the company has housed its principal officers with hundreds of clerks, stenographers, etc., to the total number of 2150 individuals, of whom 226 are women. The building itself, at the corner of Baltimore and Charles streets, cost very nearly \$2,000,000. Including the lot upon which it stands, its cost was \$2,430,790. The monthly pay-roll of the central building employees is \$197,000, an average of \$91.16 per person. Yet this is a comparatively small percentage of the number of employees of the company at Baltimore, the grand total here being 8500, the approximate pay-roll per month for all being \$575,000, an average for each person of \$67.64 per month.

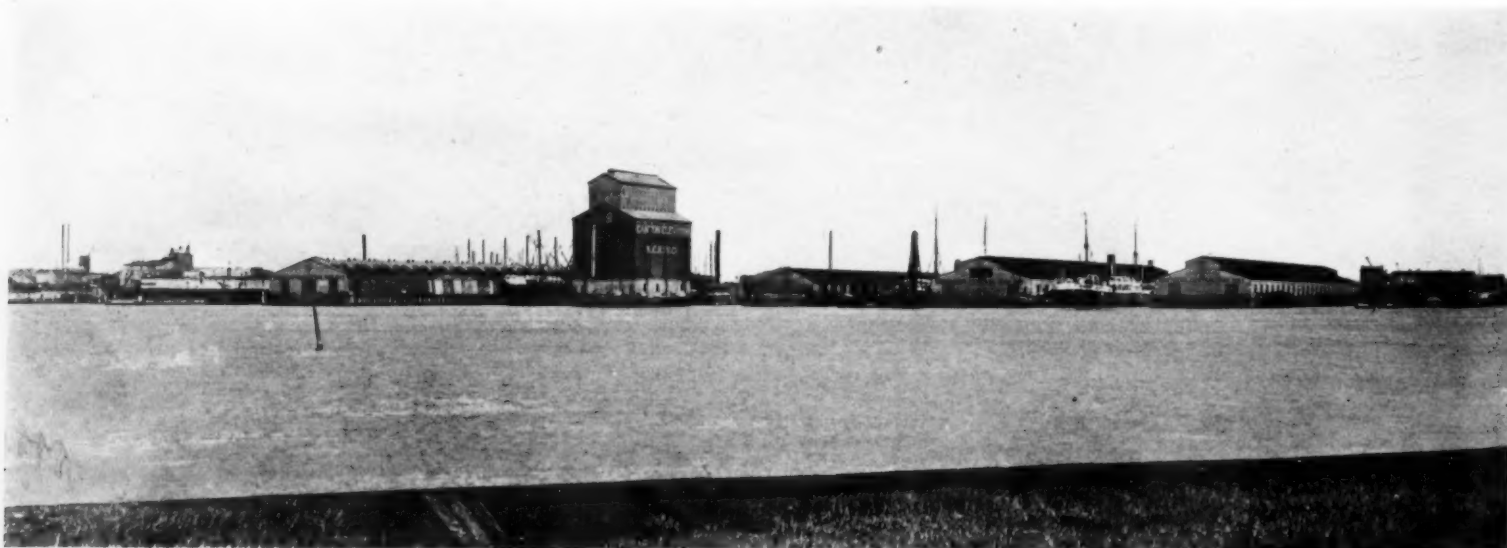
The business, both passenger and freight, handled at Baltimore by the Baltimore & Ohio Railroad for the last several years (fiscal) is as follows: 1909, \$13,006,192; 1910, \$13,635,690; 1911, \$15,278,503; 1912, \$15,563,682; 1913, \$18,143,241.

In the \$100,000,000 of expenditures of the company \$40,000,000 went for betterments to the physical condition of the property, \$47,000,000 for new equipment of all kinds, and from \$10,000,000 to \$15,000,000 are either partly spent or are in process of expenditure for betterments. Not long ago two important tunnels were completed, both for the crossing of the Allegheny Mountains, one at Kingwood, W. Va., on the line to Cincinnati and St. Louis, and the other at Sand Patch, Pa., on the line to

Pittsburgh and Chicago. Each is double tracked and about five-eighths of a mile long. This affords the system two three-tracked crossings of the mountain range, because at each place the old single-track tunnel is kept in service. On the Cumberland Division, partly in Maryland and partly in West Virginia, the company is completing an 11-mile double-tracked detour line called the Magnolia Cut-off, which, in addition to the present line, will make



THE BALTIMORE & OHIO'S CAMDEN STATION WAREHOUSE "F," 8 STORIES AND BASEMENT, 1650 FEET LONG



PIERS AND ELEVATOR OF THE PENNSYLVANIA RAILROAD AT CANTON

four tracks from Orleans Road to Little Cacapon, and practically four tracks from Cumberland to Martinsburg. There is a big tunnel included in this work, and all these improvements, like the others referred to, will increase the operating capacity of the railroad and have a direct bearing upon the bettering of operating conditions at the Baltimore terminal.

The elimination of grade crossings on the main line immediately south of Camden Station, Baltimore, is a very important change made by the company in the city. The station itself has also been remodelled and modernized, greatly improving its ability to handle trains starting from Baltimore, as well as those to and from Philadelphia and New York and the West. Mount Royal Station, uptown in the residential section, is an ornament to the city, having a handsome general appearance. It has a tall clock tower and stands in an attractive park. The company has in contemplation the elevation of its tracks above grade in the southern part of the city from Mount Winans to Locust Point, a distance of several miles, this to facilitate freight traffic to and from its steamship terminals.

The Pennsylvania Railroad system is represented in Baltimore through the Northern Central Railway and the Philadelphia, Baltimore & Washington Railroad, the latter being composed of the old Philadelphia, Wilmington & Baltimore and the Baltimore & Potomac lines. It is conspicuous for the large expenditures which it has made of late years in the building of a new union passenger station, which, while not very large as modern terminals go, is both handsome and commodious, and which cost, including the improvements of the yards around it, about \$1,000,000; also for the elevation of its tracks above the grade of streets, the enlargement of its shop and roundhouse facilities in the vicinity of Bayview Junction and Orangeville in the suburbs, which latter included the erection of a number of new buildings and the removal of its car shops from Mount Vernon yards, immediately north of Union Station, to a point near Bayview. It has also spent nearly \$1,500,000 for the erection of two double-tracked concrete bridges on its Philadelphia line near Baltimore.

But the company is particularly noteworthy for its proposed expenditure of \$10,000,000 or \$12,000,000, a large part of it in the heart of the city for the expansion and modernization of its terminal at Calvert Station, and the rest for improvements at Bayview and at Canton, the latter being its steamship terminal. These plans have been outlined by the company thus: Revision of tracks and enlarged railroad yard in the vicinity of Bayview, for real estate, tracks, buildings and other railroad appurtenances, estimated expenditure, \$3,200,000; in the Canton district for real estate, new coal pier, new yard tracks, buildings and appurtenances, estimated, \$2,800,000; at Calvert Terminal for real estate, yard tracks, buildings, street and other improvements, estimated, \$4,000,000. To properly accommodate the traffic this total of \$10,000,000 will be increased in the future by \$2,000,000.

In this proposed disbursement of millions of dollars the Calvert Station improvement would be the most conspicuous because of its position close to the center of the city. It is only five minutes' walk from



BALTIMORE & OHIO GRAIN ELEVATORS, HAVING CAPACITY OF TWO AND A HALF MILLION BUSHELS OF GRAIN



LOCUST POINT YARDS, BALTIMORE & OHIO RAILROAD, WITH ELEVATORS IN THE BACKGROUND



PORT COVINGTON TERMINAL AND COAL PIERS OF THE WESTERN MARYLAND RAILROAD

Baltimore street, on one of the principal thoroughfares. Instead of one block, which it now has, it would occupy four blocks on Calvert street. The present passenger station would be razed and a new station would be provided for suburban traffic at the northeast corner of Bath street, but it would be on the second floor of the building to be erected there, because there would be two track levels, the lower for freight uses and the upper for passenger trains. One block of stores and two blocks of dwellings which now exist would be removed and give way to accommodations of various kinds for the railroad, which already has extensive freight sheds, stations and a grain elevator from Guilford avenue to the Falls way, immediately east of Calvert street. A bridge for street traffic is projected at Madison street to carry it over the railroad tracks entering the terminal.

Commencement of this extensive improvement hesitates because the municipal authorities insist that the terminal should be equipped with electricity for the handling of trains and also for the numerous switching movements which have to be performed there. The railroad asserts that the expense of such electrical installation would be prohibitive. At present the company is using anthracite coal on its switching locomotives at the Calvert yards, which reduces the volume of smoke around the terminal very greatly as compared with the use of bituminous coal, although the gases from the engines cannot be eliminated. Until the railroad company and the city reach an understanding that is mutually agreeable the execution of the improvement plans will not be undertaken.

It is also important to note that the railroad has considered the possibility of building a tunnel under the Patapsco River near the harbor entrance for the construction of a freight cut-off, but work upon this line seems to be postponed until the terminal plans, at least, are fulfilled.

In the rehabilitation, extension and general improvement work of the Western Maryland Railway during the last 10 or 12 years Baltimore has seen the conversion and expansion of its own little local line, designed originally to retain for this city the trade of the western part of the State, into an allied part of one of the great trunk lines.

This has not been accomplished without heavy expenditures, approximately \$3,000,000 for the tidewater extension from Walbrook Station to Port Covington and for the terminal there; \$3,500,000 for the extension of 65 miles from Cherry Run to Cumberland, and between \$12,000,000 and \$13,000,000 for the 87-mile extension from Cumberland to Connellsville to effect a junction with the New York Central system. Added to these sums are several hundreds of thousands of dollars for the improvement of the Hillen Station terminal near the center of the city, which involved a complete transformation of the old passenger and freight depots there and the erection of a handsome freight warehouse six stories high, a new roundhouse and other buildings. The company has also built up a fine warehouse system throughout the city, having large and modernly equipped buildings at York street, Brown's Wharf and Canton, all of these being on tidewater. About \$20,000,000 or more have been expended by the company in improving the facilities in Baltimore and the

tributary territory, thus having a direct bearing upon the future of Baltimore.

It was in 1901 that George J. Gould and associates, including Joseph Ramsey, Winslow S. Pierce, James H. Hyde, F. S. Landstreet, J. W. Gates and others of New York, acquired the Western Maryland Railroad for something more than \$8,000,000, and immediately began to make history for it. It was part of the agreement with the city, which sold its control of the road, that adequate terminals should be built and that a railroad of trunk-line standards should be made and connected up for the West. It was understood that the Wabash would be the through connection. Later it became necessary to have

more money to fulfill the plans proposed, and the Rockefeller interests invested liberally in the property, with the ambitious results that now exist through the connection with the New York Central lines.

One of the first things outside of construction to be done was to obtain control of the West Virginia Central Railway, which was purchased from Henry G. Davis and associates. This added a large amount of line to the little system immediately, and now the Western Maryland has grown from a total of 318 miles at the time it changed hands to more than 850 miles.

It does not seem such a great while to any man who helped create this railway when it extended from Baltimore only to Union Bridge, 45 miles, in a single-track line operated with anemic engines and antiquated equipment, carrying at rather uncertain intervals conglomerate cargoes of passengers, freight, market produce, milk, etc. Today the same man marvels at the wonderful transformation which a half century has wrought. He can hardly recognize old Hillen Station in its reconstructed form, with every modern, up-to-date improvement, and the steel-car trains, electrically lighted and possessing every comfort and convenience, leaving for Pittsburgh and the West, drawn by massive locomotives, are realizations far exceeding his fondest dreams. Perhaps his greatest amazement is over the development at Port Covington, the tide-water terminal, where huge piers accommodate ships from all over the world, pouring into their capacious holds coal and other products for export, while on the other



A BALTIMORE & OHIO RAILROAD PIER WHERE VESSELS 700 FEET LONG LOAD

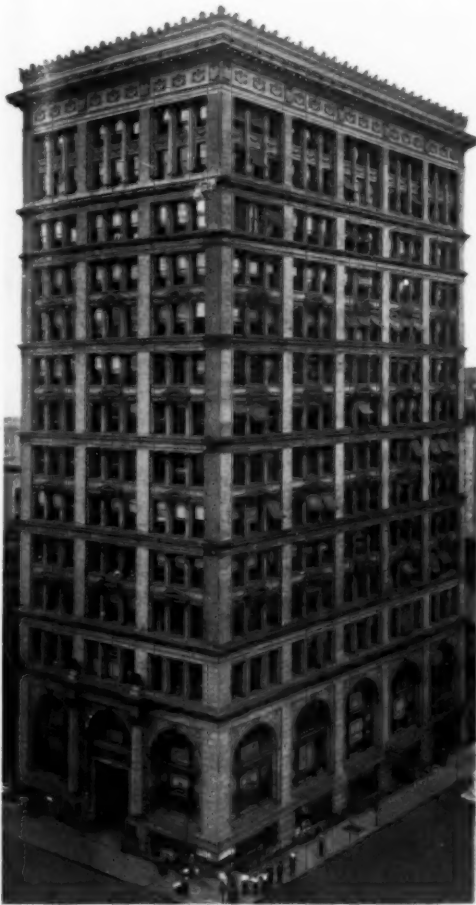


MODERN COAL-LOADING PIER, BALTIMORE & OHIO RAILROAD

side of the wharves lie other liners discharging immigrants into trains waiting to convey them westward.

Not long ago the company elected as its chief executive Carl R. Gray, president of the Great Northern Railway, and his selection by the prominent men who dominate the affairs of the Western Maryland has been accepted as indicative of great things in store for it. It is aggressively seeking business, and lately the operating capacity of the line was greatly increased by lengthening passing sidings and building other similar sidings at advantageous points.

The Maryland & Pennsylvania Railroad, an independent line, has 78 miles between Baltimore and York, Pa., via Delta. It possesses a strategic value in the railroad situation with respect to Baltimore, and there have been rumors now and then that some trunk line would acquire it. It owns a charter which will permit it to build an extension from Towson to some point on the Patapsco River, and this may be done some day.



CONTINENTAL TRUST BUILDING



MUNSEY BUILDING



CALVERT BUILDING



MARYLAND TRUST BUILDING



KEYSER BUILDING



GARRETT BUILDING

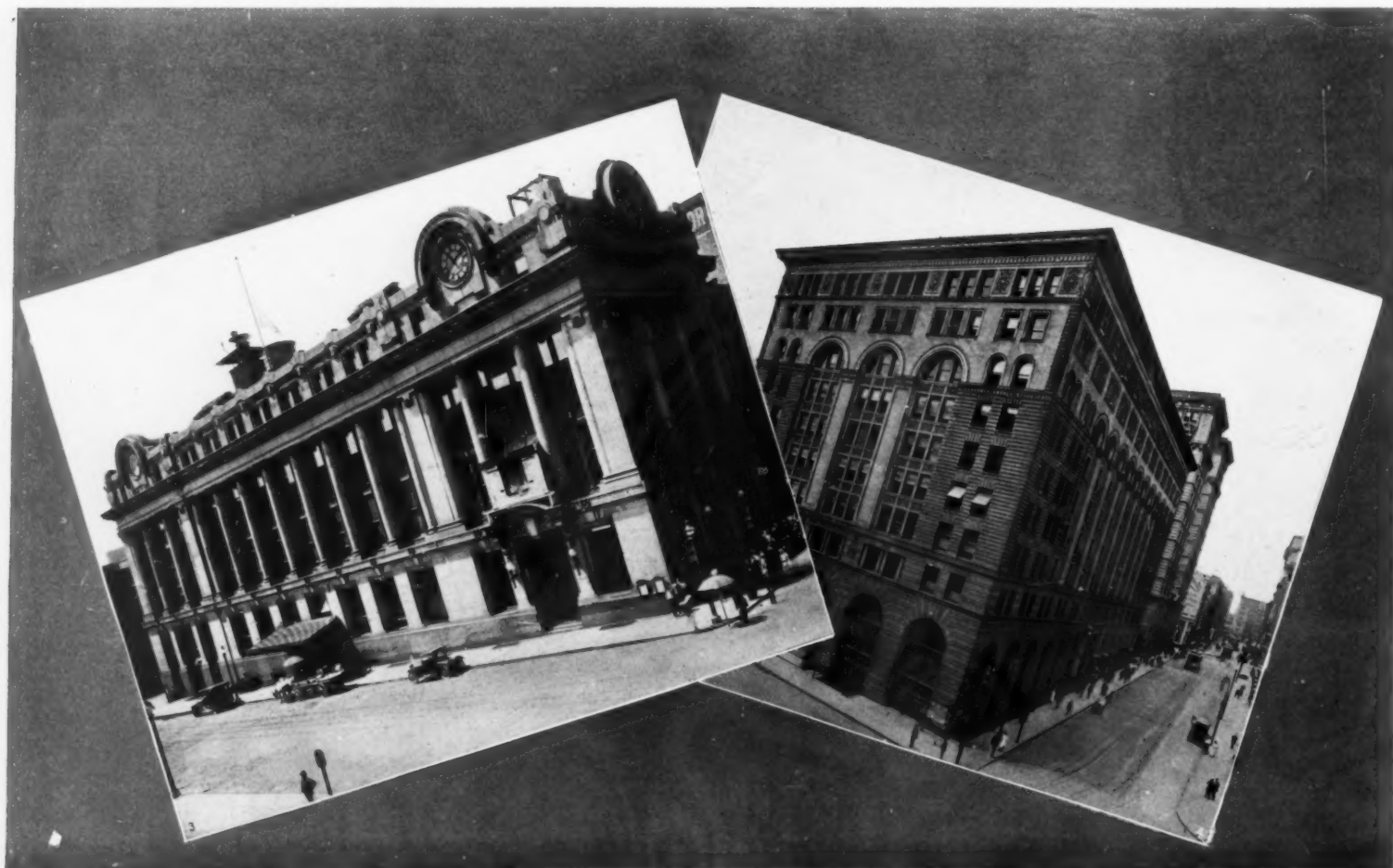
AN IMPOSING ARRAY OF SOME OF BALTIMORE'S SKYSCRAPERS



1. BALTIMORE & OHIO R. R. OFFICE BUILDING. OLD BUILDING (DESTROYED IN FIRE OF 1904) SHOWN AT LEFT



2. PRESENT HOME OF BALTIMORE AMERICAN. OLD BUILDING (DESTROYED IN FIRE OF 1904) APPEARING AT RIGHT



3. THE SUN BUILDING. ERECTED AFTER THE FAMOUS SUN IRON BUILDING WAS DESTROYED IN THE GREAT FIRE

4. EQUITABLE BUILDING—FIRST MODERN OFFICE BUILDING ERECTED IN BALTIMORE



1. U. S. FIDELITY & GUARANTY CO.



2. FIDELITY & DEPOSIT CO.



3. EMERSON HOTEL



4. BELVEDERE HOTEL

Baltimore Homes for People of Moderate Means

IN six and a half years about 14,000 two-story houses with all modern improvements have been built at a cost of \$20,000,000 in Baltimore for mechanics and other men of moderate means. Baltimore is distinctively a city of homes, and not one of tenements. Its population is fairly well distributed over its whole area. It has few spots where men, women and

the two-story house on a basis where the wage-earner could buy a home out of his earnings. Without the ground-rent system these same homes would cost from \$2000 to \$3000, and it would be difficult for the average workman to undertake the purchase of a house, because the weekly installments would be more than he could stand.



THESE PICTURES SHOW TWO TYPES OF TWO-STORY RESIDENCES, OF WHICH BALTIMORE HAS MANY THOUSANDS

children are banded in crowded stories lining narrow streets. Its wage-earners are largely dwellers in two-story homes, and many of them are owners of these homes.

Baltimore's famous two-story houses occupy a commanding position among the influential factors that have made for the city's healthy and substantial growth, for they have proven the magnet which has drawn to and held in this city the better class of mechanics and general workmen.

These little houses are modern in every particular. Practically all of them are built of brick with white marble steps and trimmings, and quite a number of the newer ones now have porch fronts. The interiors are attractively arranged, and electric lights and gas ranges are provided, together with bathrooms and modern sanitary equipment, the latter being compelled by laws governing their construction.

During the past six and a half years nearly 14,000 of such houses have been built in the city proper at a cost of \$20,000,000, while in the suburbs immediately adjoining the city many more thousands have been erected.

They are constructed to sell at from \$1200 to \$2000 each. The home buyer purchases through a building association, quite a number of which are established in all parts of the city. In buying the purchaser makes a first payment of \$100 to \$200, the amount varying according to the cost of the house. After this initial sum he makes weekly payments, which are arranged to include an installment on the purchase price of the house and all expenses, such as ground rent, taxes, water rent and insurance. Weekly installments range from \$5 to \$7 on the \$1200 to \$2000 houses, and in eight to ten years the full purchase price of the house is worked out and it becomes the property of the home buyer.

Each of the houses carries with it a 6 per cent. ground rent running from about \$42 to \$60 per year, making the value of the ground \$700 to \$1000. These ground rents are redeemable after five years at their face value at the option of the owner of the house.

The Baltimore ground-rent system has been criticized in some respects, but it has been this very system that has made possible the development of

These houses can be sold at low rates, because they are built in large units by the men who make a specialty of such development. An operator will purchase a number of acres of ground, lay out the property for two-story house construction and build entire blocks of them. By doing this he can buy all of his material in large quantities, thereby effecting great saving in his purchases, all of which tends to make the unit cost per house low.

Through the sale of the ground rents created by the development he is able to finance his undertaking, because these ground rents bear 6 per cent. interest and are considered gilt-edge investments.

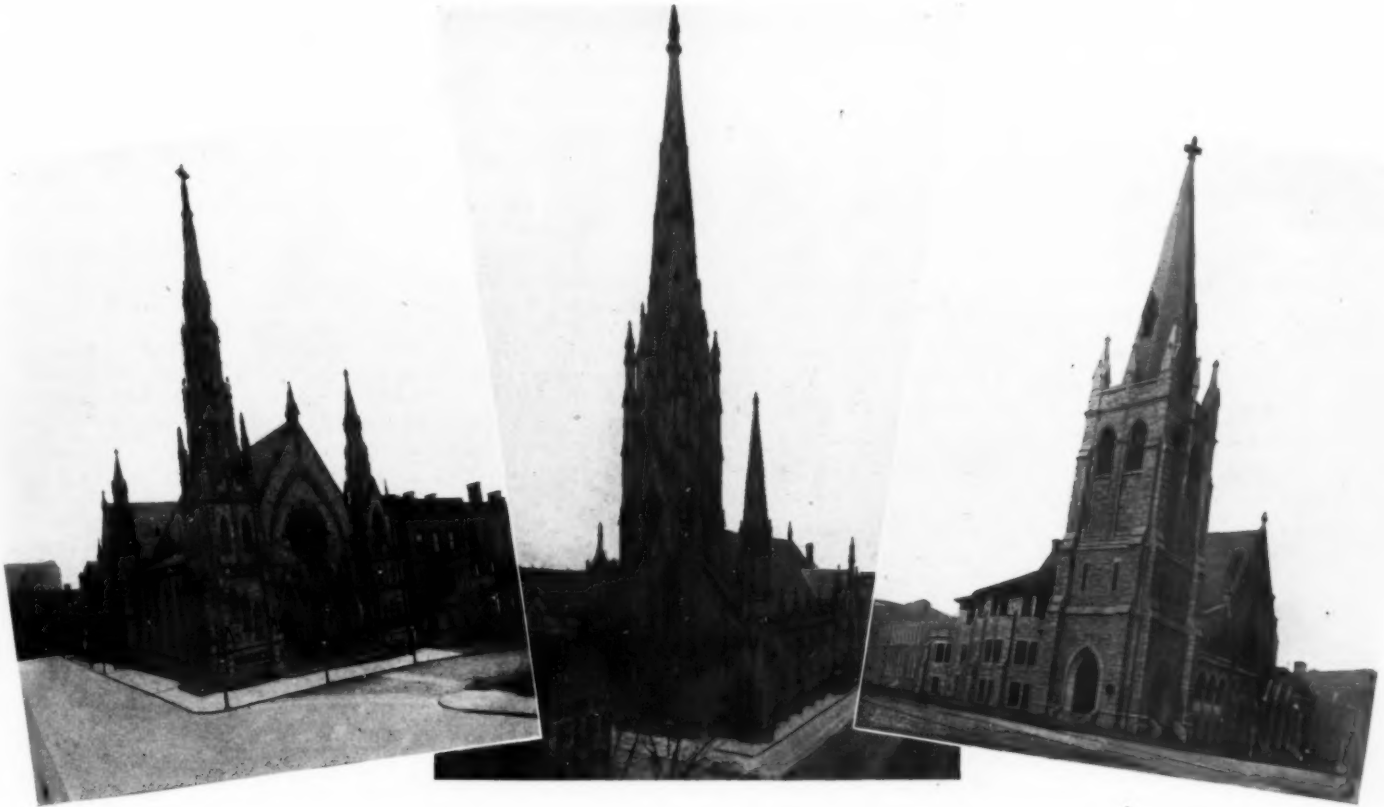
As an illustration of the saving accomplished by building these homes in large numbers, a prominent operator arranged for the construction at one time of over 250 houses in one of the eastern sections of the city. For this operation he purchased in one contract 10,000,000 bricks at \$6 per 1000. The same brick purchased for the construction of only one or two houses would have cost \$9 per thousand, so that in this one operation he effected a saving of \$30,000 on brick alone.

In the same way are purchased lumber, roofing materials, interior work and fixtures, so that quite a large amount is saved in a big operation of this kind. The home buyer gets the benefit of this, because it enables the operator to sell a house cheaper than it would be possible for an individual to build one.

In every direction can be seen row after row and block after block of two-story houses. They are all located on smooth, paved streets.

The housewives take keen pleasure in vieing with one another to have the cleanest front and the prettiest yard in the neighborhood, so that in every part of the new sections visited one can find everything in a condition that makes for health, happiness and contentment.

With such surroundings and opportunities, Baltimore has been able to gather together great numbers of thrifty, substantial workmen, who take pride in their homes and civic affairs, and who supply to the industries of the city a class of mechanics that is not surpassed by any community in America.



TYPICAL OF BALTIMORE CHURCHES—A FEW OF THE CITY'S MANY BEAUTIFUL HOUSES OF WORSHIP

- | | | | |
|-----------------------------------|--------------------------------------|------------------------------------|-------------------------------|
| 1. MT. VERNON METHODIST EPISCOPAL | 3. FIRST BAPTIST | 5. OHEB SHALOM SYNAGOGUE | 7. ROMAN CATHOLIC CATHEDRAL |
| 2. FIRST PRESBYTERIAN | 4. FIRST CHURCH OF CHRIST, SCIENTIST | 6. ST. PAUL'S PROTESTANT EPISCOPAL | 8. ZION LUTHERAN PARISH-HOUSE |

The Magnitude of Baltimore's Industrial Interests

IN what the census reports call the "Metropolitan district of Baltimore," which includes the city proper and the immediate suburbs, the total amount of capital invested in manufacturing is \$270,000,000, and the value of the products of these factories amounts to \$352,000,000 a year.

A better conception of the magnitude of the industrial interests which produce so vast a sum can be understood when it is remembered that the entire wheat crop of the United States last year was worth \$610,000,000, and Baltimore's factory products were equal in amount to 58 per cent. of the value of the wheat crop raised on over 50,000,000 acres of land.

The South produces nearly two-thirds of the world's cotton, and last year the value of the South's cotton, including seed, raised on 36,000,000 acres of land was over \$1,000,000,000. But the value of the factory products of the Baltimore district was more than one-third as great as the total value of the South's cotton crop.

The value of the products of these Baltimore factories is equal to nearly one-half of the value of the hay crop of the United States raised on 48,000,000 acres, and is nearly three times the value of the tobacco crop of the United States. It is more than \$100,000,000 in excess of the total value of the Irish potato crop of the country.

A study of these comparisons will enable anyone to gain a fair idea of the industrial interests in and around Baltimore.

Another way in which the magnitude of Baltimore's industrial output may be stated is by comparison with the total value of all of the agricultural products of the State of Maryland. In 1913 the total value of all farm products, including livestock sold and slaughtered in Maryland, amounted to \$72,000,000, or just a little more than 20 per cent. as much as the value of the factory products of Baltimore.

The manufacturing interests of this city have grown so quietly, though steadily, that comparatively few people, even Baltimoreans themselves, have fully understood how great an industrial center Baltimore has become of recent years.

While we have no vast industry of over-shadowing importance such as iron and steel in Pittsburgh, or automobile-making in Detroit, we have a wide diversity of interests both large and small, steadily expanding and giving employment to an ever-increasing number of men and women, and this is a far safer and sounder basis for continuous progress and prosperity than when a city's business life is largely founded on one great line of industry.

The unusual advantages of Baltimore as a home-making place have resulted in bringing to this city a very large number of well-to-do working people, who find in this city advantages not matched elsewhere.

In the diversity of the industrial interests here employment is found for mechanics of every kind, from the highest skilled worker in iron and steel and brass to the makers of a thousand different things produced in the factories of the city.

The clothing trade, the underwear industry and the manufacture of straw hats, one of the leading interests of the city, furnish employment and good pay to many thousands of women. In many cases the factories are so located that these employes do not have far to travel between their homes and their places of employment. A very striking illustration of the demand for female labor in these higher classes of factory work is seen in the fact that the daily papers of the city carry advertisements every day from a large number of factories calling for more employes. This competition for labor compels employers to make constant improvements in the conditions under which their people work.

This city is rounding out an industrial development which, in diversity of interests and employment, will soon match that of any other important place in the world. In the comfort in which its working people can be housed, and in the abundance of the best quality of foodstuffs at the lowest cost, Baltimore has no equal. Added to these things are the advantages for education and for all religious activities which this city offers. Elsewhere in this issue these points are brought out in detail so that a careful study may be made by everyone who wishes to fully understand the foundation on which Baltimore is building.

This city has only begun to grow. Its industrial interests are in their infancy. What has been accomplished is only an indication of what the coming years will show.

Yearly Commerce of This Port Totals \$439,906,468

THE water-borne trade of Baltimore amounted last year to \$439,906,468, according to the forthcoming report of Colonel Lansing H. Beach, United States engineer in charge of the Baltimore district. The engineer's reports of former years showed only the foreign commerce of the port—the articles exported to or imported from foreign countries, which gave an altogether inadequate idea of the full volume of Baltimore's water-borne trade.

For the period covered by the latest report, Colonel Beach made original investigations, and while he states that he did not receive complete co-operation at the hands of all shippers, and that therefore his figures do not now represent the full total of the commerce of this port, he was able to so much more completely cover the situation that a total of 9,373,000 tons of coastwise commerce is reported. The value of this coastwise commerce amounted to \$273,836,797 out of a total of \$439,906,468, greatly exceeding the foreign commerce of the port, which is given as \$166,069,671 for the period named.

Following is the itemized statement of Baltimore's coastwise commerce contained in the report for the year ending December 31, 1913, which is the first time an itemized statement has appeared in an engineer's report:

Articles.	Coastwise Commerce.		Valuation.
	Amount in customary units.	Amount in short tons.	
Acid, sulphate, tons.....	412,000	412,000	\$2,884,000
Ammonia, sulphate of, tons.....	2,705	2,705	167,660
Baskets, fruit, empty, number.....	572,809	876	28,640
Boots and shoes, cases.....	859,366	25,781	34,374,640
Box shooks, boxes.....	326,380	1,190	24,470
Bricks, assorted, number.....	10,870,400	27,176	108,704
Bricks, vitrified, number.....	8,000,000	36,000	200,000
Cans, empty, cases.....	4,070,342	34,578	2,036,230
Canned goods, cases.....	2,772,011	96,768	5,334,394
Cement, barrels.....	77,830	15,566	106,745
Clay, tons.....	9,924	9,924	49,620
Cordwood, cords.....	4,733	7,099	18,985
Corn, bushels.....	41,600	1,165	31,200
Cotton, bales.....	78,040	19,510	4,877,500
Cotton manufactures, cases.....	153,723	23,058	6,917,400
Coal, all kinds, tons.....	3,297,067	3,297,067	10,029,701
Dry goods, tons.....	50,076	50,076	*
Fertilizer and materials, tons.....	676,676	676,676	9,080,140
Fish, all kinds, pounds.....	23,177,000	11,589	463,600
Flour, barrels.....	362,260	36,226	1,811,300
Fruit and farm produce, tons.....	76,685	76,685	1,187,671
General merchandise, tons.....	1,481,818	1,481,818	148,181,800
Ground shell lime, tons.....	6,754	6,754	10,131
Hay and feed, tons.....	1,640	1,640	28,700
Iron and steel manufactures, tons.....	34,983	34,983	2,798,640
Ice, tons.....	84,142	84,142	252,000
Lumber, all kinds, feet B. M.....	297,599,263	595,199	5,931,541
Leather, tons.....	2,784	2,784	2,672,640
Lime, tons.....	2,950	2,950	25,075
Laths, number.....	1,577,700	473	3,737
Marble, tons.....	6,210	6,210	207,000
Naval stores, tons.....	29,976	29,976	2,398,080
Nitrate of soda, tons.....	60	60	2,500
Oysters in shell, bushels.....	2,651,425	106,058	1,352,596
Oyster shells, bushels.....	6,000,595	180,017	92,150
Oyster shells, ground, tons.....	15,216	15,216	91,300
Oats, bushels.....	38,350	499	17,257
Oils, all kinds, barrels.....	93,436	18,103	934,360
Ore, tons.....	170,000	170,000	1,500,000
Potatoes, bushels.....	6,000	158	2,400
Piling, linear feet.....	5,996,000	104,930	299,800
Poultry and stock foods, tons.....	20,009	20,009	170,288
Peanuts, tons.....	504	504	50,400
Soda and potash, tons.....	6,506	6,506	162,650
Starch, tons.....	5,636	5,636	450,880
Sand and gravel, tons.....	1,497,756	1,497,756	599,102
Shingles, number.....	378,000	170	2,170
Salt, tons.....	2,079	2,079	16,273
Sugar, tons.....	1,194	1,194	95,520
Stone, crushed, tons.....	2,010	2,010	2,010
Tobacco leaf, tons.....	51,601	51,601	10,320,200
Tobacco manufactures, tons.....	4,122	4,122	3,297,600
Tinplate, tons.....	6,996	6,996	546,305
Wheat, bushels.....	1,665,596	49,968	1,499,036
Wool, tons.....	10,368	10,368	4,147,200
Whiskey, tons.....	10,400	10,400	5,942,856
Total.....		9,373,004	\$273,836,797
Foreign exports.....			117,269,378
Foreign imports.....			35,553,514
Canadian articles received in bond during the year and exported..			13,246,779

Total commerce of the port..... \$439,906,468

*Valuation unobtainable.

A Baltimore House That Leads the World in Decorated Tin Box Output

By ALBERT PHENIS.

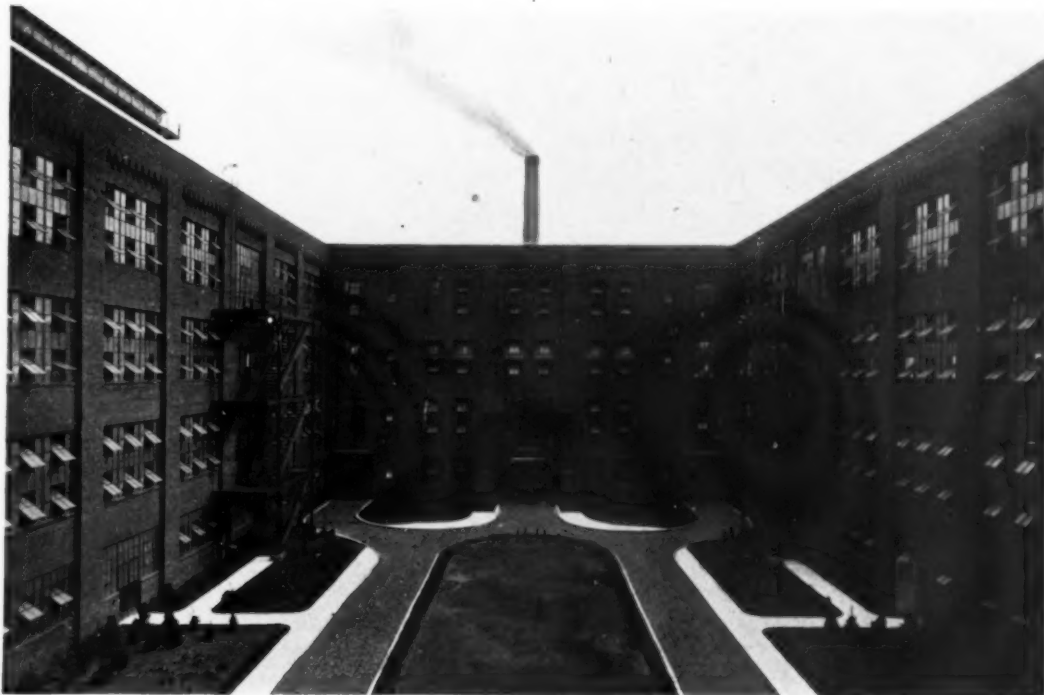
UNTIL one has visited every floor and department of the Tin Decorating Co. of Baltimore, and has seen the way the highly-developed machinery of that plant—much of it automatic in action—goes through the various

steps of turning out 4,000,000 pieces of decorated tinware each day, no adequate idea can be formed of the interesting extent to which the industries of Baltimore have been developed. There is no plant of the kind in the world so extensive, the next largest having a capacity of little more than a third as much as this. In perfection of equipment, as well as in size of plant, none is in its class, and it really is a revelation to find that such an institution, a world-beater in its line, has been built up in Baltimore within a comparatively few years of time and its magnitude so little known outside of its immediate trade circles.

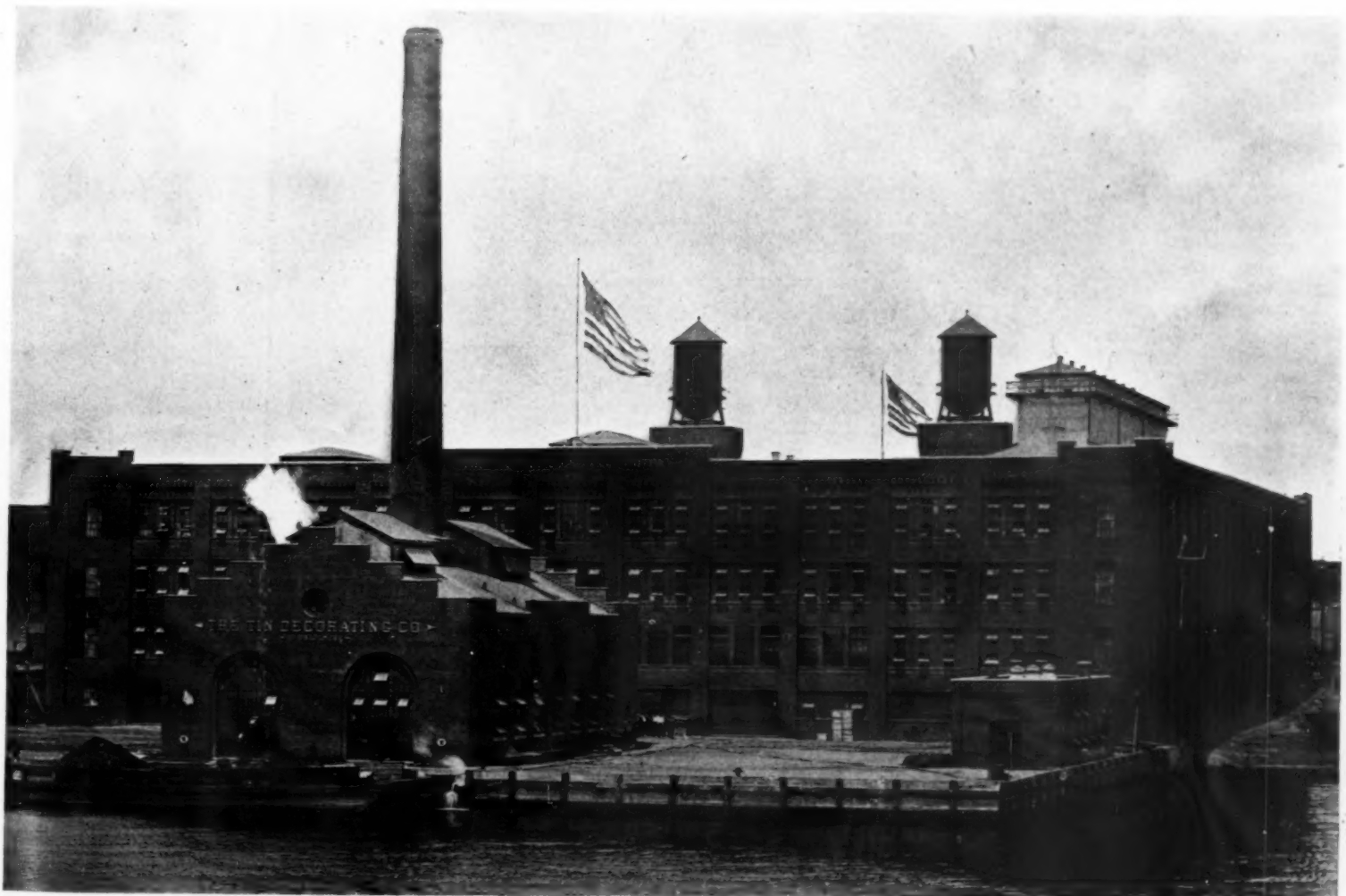
It was 22 years ago that Washington I. Tuttle came to Baltimore from Rochester, N. Y., as manager of the Marburg Bros. branch of the American Tobacco Co.

Fourteen years back, with a visible use of only \$200,000 worth of decorated tins per annum, the nucleus of the Tin Decorating Co. of Baltimore was established in the shape of a department of the Marburg Bros. branch.

With amazing vigor and ingenuity Mr. Tuttle proceeded to perfect machinery, methods and processes and to enlarge the scope of the market. From making tags and boxes for tobacco, the business has been extended to take in almost every variety of decorated tin articles, till a business of \$3,000,000 a year has been built up. Tin powder horns, tin talcum powder boxes, tin caddies, and a great variety



ORNAMENTAL COURTYARD WITH GRAVELED WALKS, GRASS PLATS AND SHRUBBERY



EXTERIOR VIEW OF THE TIN DECORATING CO.'S NEW BUILDING FROM THE HARBOR FRONT



ROTARY LITHOGRAPH PRESSES WITH AUTOMATIC UPRIGHT DRYING OVENS—CAPACITY 500,000 TIN SHEETS PER DAY

of tin articles, covering more or less all known uses of tin packages, are now manufactured for the general trade, although \$2,000,000 of the \$3,000,000 annual output covers the various kinds of tin boxes, tags, etc., used for smoking and chewing tobacco. Sheets of plain tin are carried through various processes of varnishing, coating, printing, cutting, bending and stamping, until they come out in their completed shape, packed and ready for shipment. Some idea of the rapidity with which operations are carried on may be gained from the fact that the completed tin box for Tuxedo smoking tobacco is turned out at the rate of 755 per minute—and this is only a sample of the big units of output the plant's activities show.

From basement to top story there is a succession of interesting processes, representing the latest and most economical, labor-saving and efficient methods of decorating and manufacturing tin packages, and, unlike most institutions of the sort, President Tuttle announces that anybody is welcome to visit the plant at any time.

On May 1, 1912, the Tin Decorating Co. of Baltimore was incorporated as a distinct and separate organization. The business had long since outgrown the facilities of the old plant, and a new location was secured at the foot of Boston street, on the harbor. The site comprises about five acres, fronting 287 feet on Boston street and extending 940 feet into the harbor. The original bulkhead was located about 300 feet from the Boston-street frontage. The balance of the site consisted of water, showing an average depth of about 20 feet. In providing sufficient area for the proposed new building and power plant, covering a space of 275x540 feet, it was necessary to construct 687 feet of concrete bulkhead, 45 feet deep, with an average thickness of 7 feet. This involved the

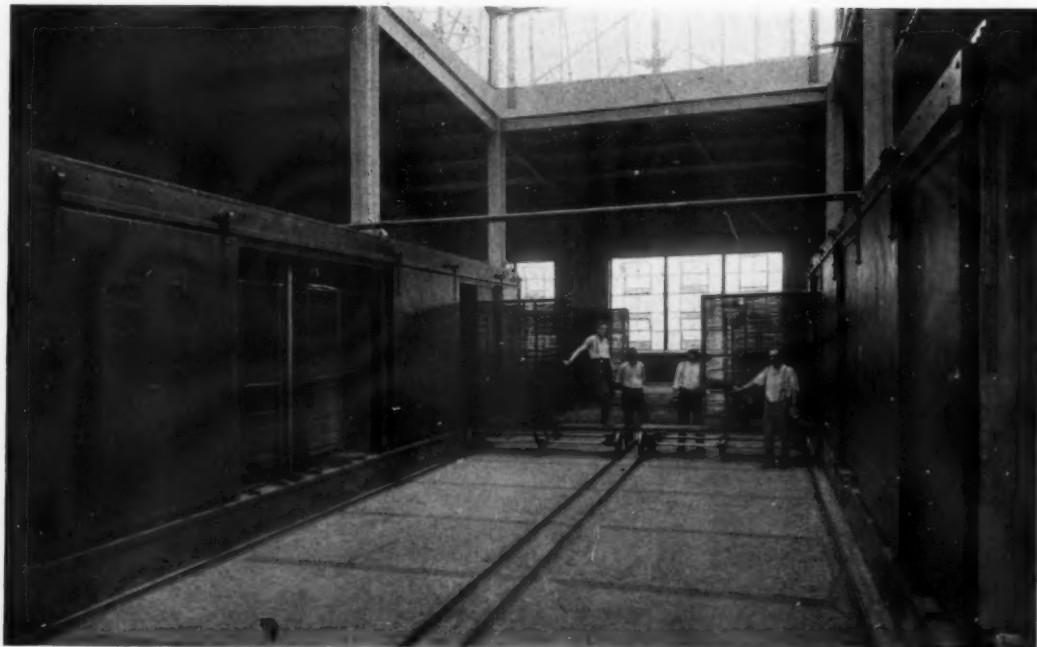
use of 8000 piles for bulkhead, building and power plant, and 60,000 to 70,000 cubic yards of earth were required for filling in the bulkhead. There are one and a half acres of reserve land in the reclamation made, with a further reserve of three acres of water space, on which it is contemplated to eventually construct piers and storage warehouses.

The contract for the construction of the building was awarded April 21, 1913, and the new structure was ready for occupancy in June of this year. The building is in the form of a hollow square, with an embellished court in the center 160x140 feet in size. The building is four stories in height, fireproof throughout, and is considered mechanically, architecturally and industrially perfect. It is roomy and yet compact, so there is no lost motion in advancing the raw material from its arrival to its shipment in the form of the finished product. A large per cent. of the wall space on court and outside walls is devoted to windows after the manner of the modified "daylight" factory building, and so great a flood of light is thus provided that no artificial illumination is contemplated or considered necessary for the ordinary working hours of the plant.

The actual floor area of the plant comprises a trifle over seven acres. The equipment of machinery represents an investment of approximately \$1,250,000. It includes 35 lithographic metal decorating presses. So far as known, there is no other tin decorating plant that has any such number of presses under one roof. All in all, with flat-bed presses, rotary presses, shaping machines, stamping machines, manufacturing dies, and in the general operation of the plant, there are 2500 belt-driven pieces of machinery. There is a large and completely equipped machine shop, where the company makes all its own dies and takes care of the repair of all the machinery of



AUTOMATIC MACHINERY MAKING TUXEDO TIN BOXES—755 PER MINUTE



HORIZONTAL OVENS, EACH CONTAINING SEVEN MILES OF 1½-INCH STEAM PIPE



LITHOGRAPHIC DEPARTMENT,
FLAT-BED PRESSES

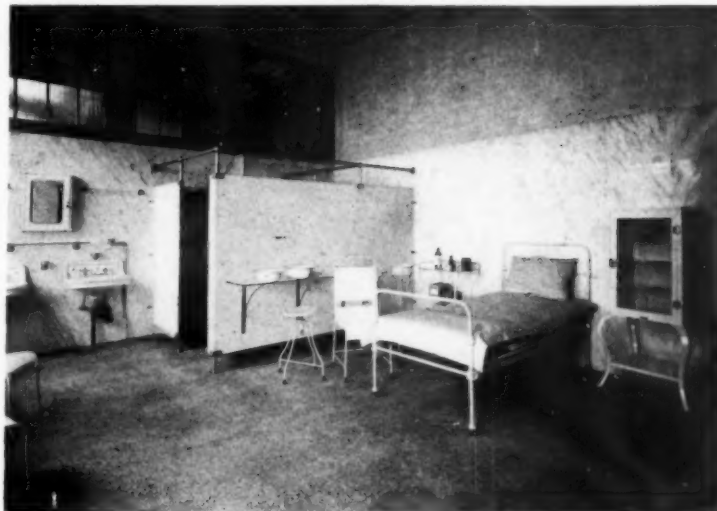
the plant. Power is supplied by the company's own plant, located on the harbor front of the lot. Large quantities of steam being required in the operation of the drying ovens, it is impossible for the plant to buy power to advantage. The boiler capacity of the power plant is 1000 horsepower minimum, with similar generating capacity. It is equipped with Harrisburg-Fleming cross-compound condensing engines, Westinghouse generators in duplicate, and all the equipment is of the highest known standard of efficiency.

In the equipment and operation of the plant throughout economies of all sorts have been introduced, so the maximum of product, with the maximum of grade, may be secured at the minimum of cost. Wherever possible to obtain or devise it, automatic machinery has been installed, with the result that there has been a tendency to decrease the number of hands, while increasing the output covered by a given length of time. The workmen are mainly employed by the piece, and are stimulated to their best efforts, with consequent appreciation in earning capacity. The man who can turn out the most work in a given time is the man most appreciated by the management, and the increased amount of money he draws is looked at with approbation. A very few girls are employed at the plant. The average number of employees is 1400.

An illustration of the economy and efficiency characterizing the management is afforded by the type of oven in use. After experimenting with various kinds of other people's ovens, Mr. Tuttle had a home-made one installed, with the result that while of simple and inexpensive construction, it was approved by the underwriters and is operated at small cost. Incidentally, there are 35 miles of steam pipe installed in the ovens for drying and baking. A maximum heat of 250 degrees is required. In addition to the ordinary drying and baking ovens, there is one set of automatic upright drying ovens, representing an investment of \$90,000, which has a handling



VARNISHING AND COATING ROOM, AREA 80x350 FEET



SURGICAL ROOM, FINISHED IN ITALIAN MARBLE



ANOTHER COURTYARD VIEW, LOOKING TOWARD THE FRONT



COMPANY'S MACHINE SHOP, AREA
80x150 FEET

capacity of 500,000 sheets of tin per day.

As a further indication of the magnitude of the company's operations, take the statement that the average amount of tinplate used by the plant during a year amounts to 500,000 boxes, and the average number of decorations consists of five prints or press impressions. This represents the handling of the equivalent of 2,500,000 base boxes of tinplate. There are also handled yearly some 200 car lots of black iron and wire.

With a switch track in front of the building and a ship dock alongside, the company has been able to dispose of all the teams necessary at the old location, with a resultant great saving in handling costs. A large proportion of the company's output is shipped by boat.

Consideration of the welfare of the employees is a cardinal principle with the management. The well-kept courtyard, with its greensward, settings of shrubs and location for a fountain, is a grateful spot on which the eye falls, and it has a cheering influence on the spirits of the men, as many of them have declared to President Tuttle. Then, inside the building, there is increasing evidence of thoughtful care by the management. Lockers, marble toilets and marble shower baths, as fine as may be found anywhere, are set apart for the employees.

There is a gratuitous arrangement by which the company pays \$500 to the family of any employee killed by accident in the plant after he has been one year in employment. Hospital bills are paid in cases where an employee suffers any serious accident while on duty, and for first aid and the treatment of trivial cases an emergency hospital, or surgical-room, has been established in the building. It is fully equipped, is in charge of a trained nurse, and is visited at 11 o'clock every morning by the company surgeon, Dr. James M. Craighill, who also comes in response to a call at any time. All this is at the company's expense, manifesting a blending of the humanitarian and the utilitarian in a most highly developed form.

How a Complete Modern Paving Organization Works



AS CALLOW AVENUE LOOKS REPAVED

IN the great work of repaving every Baltimore street and alley, the manner in which the work has been carried on is of almost equal interest with the magnitude of the job, for everything has been done in the most up-to-date manner and the work has features that engineers and contractors in other municipalities could study to advantage. There is a snap and a go in the way the work has been crowded along, which in some cases has been finished in record-breaking time and in advance of date specified in the contract.

Conspicuous in this line have been the operations of the Union Paving Company of Schenectady, N. Y., which include the very important work on Baltimore street, the busiest business street in the city. The work was pushed right along without serious interruption with street car or vehicle traffic. Taking one side of a street at a time, the old paving was dug up and whisked away in automobile trucks; concrete was mixed by a portable mixer; the materials for the binder and afterwards the hot asphalt topping were dumped from a motor truck, and then the rollers, dodging in and out as street cars passed by, would finish up the job, and almost immediately after the rollers got off the street it was ready for traffic.

The Union Paving Company, coming to Baltimore for the first time this spring, at once established a name for its rapid-fire manner of tackling a job and getting through with it. As paving contracts are awarded by the Paving Commission, which is composed of Baltimore business men of the highest character, all contracts are awarded on the merits of the bids without any question of favoritism. It is thus a tribute to the organization and efficiency of the Union Paving Company that they were able to secure some twenty contracts before they had been in the city thirty days. Mr. Charles D. Beckwith, president of the company, has given the work here the benefit of his conspicuous energy and wide experience.

Organization and equipment are the strong points of the Union Paving Company, the equipment comprising the best and most modern in methods and machinery. Wherever possible automobile trucks are used for the rapid transportation of materials, and all the equipment is on wheels, even to the asphalt plant. This is an ingenious device of the East Iron & Machine Company of Lima, Ohio, and is called the Merriman portable one-car asphalt plant. It is mounted on railroad car trucks, so that railroads will haul the plant anywhere. When brought to any city it is switched to a convenient siding, with room for a material yard alongside, and where asphalt and cement may be unloaded from cars on tracks adjoining. The plant is equipped with steam-heated

kettles, which makes it impossible to burn the asphalt. All necessary boilers, hoisting engines, etc., are a part of the equipment, and mechanical perfection of the plant enables it to withstand hard usage. The first plant gotten out has been in use eight seasons and is still doing as good and as large an amount of work as any of the new plants. The daily capacity of the plant in use here by the Union Paving Company is 1800 square yards of 1½-inch binder and 1600 square yards of 1½-inch topping.

All of the cement, curb guard, limestone dust for asphalt filler, and all the brick used by the Union Paving Company here, were furnished by E. L. Benedict, paving materials specialist, with offices in the Munsey Building. Allentown Portland cement has been used exclusively by the Union Paving Company, 25,000 barrels being covered by their present contracts. In accordance with Mr. Benedict's trade slogan, "Best by Test," it is recorded that not a barrel of this cement has ever been rejected by the Baltimore Municipal Laboratory.

Clip-bar and T-head curb guard, furnished by Mr. Benedict, has been used for all the work done by the Union Paving Company here, and in more than 75 per cent. of all curb work done in Baltimore this year.

The work done by the Union Paving Company here includes the paving of Baltimore street from Market place to Liberty, completed some weeks ago, ahead of contract limit, and Baltimore street from Liberty to Fremont, which will be entirely finished by September 3; work completely finished includes the paving of Callow avenue, from North avenue to Whitelock street; Reservoir street, from Callow avenue to Mount Royal terrace; Brookfield avenue, from Whitelock street to Park drive; Chauncey avenue, from Linden avenue to Brookfield avenue; Brook's lane, from Linden avenue to Brookfield avenue; Monroe street, from North avenue to Clifton avenue; Pulaski street, from Westwood avenue to Baker street; Presbury street, from Smallwood to Payson street; alley between Brookfield avenue and Lakeview avenue, from Whitelock street 700 feet north; alley south of Park terrace, from Brook-

field avenue to Lakewood avenue.

Work is under way on Bentalou street, from North avenue to Clifton avenue, and from Edmondson avenue to Presbury street; Smallwood street, from Clifton avenue to Windsor avenue; Clifton avenue, from Bentalou street to Smallwood street; Presstman street, from Bentalou to the old city line; Harlem avenue, from Bentalou to Warwick avenue; Wheeler avenue, from Arunah avenue to Harlem avenue; Warwick avenue, from Arunah avenue to Harlem avenue. The company also has a contract for the paving of Eutaw street, from Baltimore street to Madison avenue, work on which will begin after the Star-Spangled Banner Centennial Celebration, September 6 to 13.

As equipment is a strong point in favor of any competitor for work, it

is noteworthy that the Union Paving Company brings to any community where it operates a separate fully equipped organization, with asphalt plants, rollers, mixers and everything required for street work. The equipment here consists of portable asphalt plant, four concrete mixers, four steam asphalt rollers, one earth roller, one rock crusher, one steam shovel with a capacity of a yard of dirt every thirty seconds, one concrete curb mixer (gasoline), three automobile trucks and eight teams. Other trucks and teams, to the number of twenty or more, are hired as needed.

The company is doing work now in New York, Connecticut and Maryland, in all of which States it has complete equipped organizations. It has done work also in Massachusetts and Pennsylvania, and is prepared to bid in any State. Water pipe work, grading, street opening, foundation work, etc., are some of the company's past activities, and it is incorporated to do any kind of work.



MERRIMAN RAILROAD ASPHALT PLANT, STATIONED AT BALTIMORE



STEAM SHOVEL LOADING AN AUTO TRUCK



LAYING CONCRETE FOUNDATION FOR NEW PAVING

The Best Suburban Development in the World



A HOUSE IN GUILFORD

WITH Guilford the Roland Park Company is completing what experts from Europe as well as from this country say will be the most beautiful, well-rounded suburban development any single organization ever achieved. All told, it will represent an ultimate investment of \$40,000,000. A thousand acres of restricted territory, at Baltimore's very doors, are included in these operations. Guilford is the crowning achievement of efforts continuing consistently through almost a quarter of a century, bringing harmonious and artistic treatment to a densely wooded, rugged plat of a thousand acres, that stands today the masterpiece of suburban development. Terraces and hills, sunken gardens and parkways, shrubbery, flowers and trees for the barren places, and a reverent care for every big tree that could possibly be preserved, are ever present manifestations of the spirit that has accomplished a development along the finest lines.

Olmsted Brothers of Brookline, Mass., the eminent landscape architects, laid out the general scheme of roads for the entire Roland Park-Guilford development. Winding roads, boulevards and drives have been arranged to give the greatest convenience and the easiest practical grades, while at the same time preserving the harmony of the contour and providing vistas and affording glimpses of hill and dale, near and far, and the towers and spires of Baltimore in the distance.

There were more difficult problems in the handling of Roland Park than have been met with in Guilford's development, although here, too, there has been wide scope for the skill of the landscape architect. But Guilford was not so full of extremes of height and depth, and having long been the country home of the Abells, founders of the Sun, it was more of a compact, well-kept estate. Also there were but 336 acres in this tract, as against more than six hundred in the various plots of the Roland Park tract. Having been purchased only three years ago, and being partly within the city limits, the cost of the ground was greater, and the scale of development will be on a more expensive plan. The restrictions as to the cost of buildings will be maintained at a higher level, and in all ways Guilford will be treated as an advanced example of city planning.

In general, features that made the development of Roland Park so eminently successful will be retained, while Guilford will receive the benefit of the twenty years' experience the company had in the Roland Park work.

An elaborate system of sanitary sewers, with separate storm-water drains, such as Baltimore is only now finishing up, was provided for in Roland Park

at the beginning of developments; also an entirely independent water-works system and an electric plant. Good roads and sidewalks were also constructed throughout. Guilford's development has been handled in the same comprehensive manner. The two tracts will contain about 27 miles of modern roadway.

From the beginning of the development the Roland Park Company built a number of houses on its own account, for sale, its purpose being to establish a precedent of a certain standard both as to design and construction. Prior to 1905, when the company organized its Architectural Department, various architects in Baltimore, Philadelphia and New York were employed. For a few years the work of the Architectural Department was practically confined to the design of relatively small cottages, both for the company and for individual lot owners, but for the past five or six years it has been designing large dwellings for the company and others, as well as smaller houses.

In addition to the Architectural Department and the extensive Roland Park building department, which does general contracting work, there is an engineering department, also of much importance, and a nursery department that supplies trees, shrubs and flowers, used in great numbers all over the park.

As great attention was paid to social needs as to physical requirements from the beginning of the Roland Park development. Churches and schools were encouraged, and a Woman's Club and a Country Club with as fine a golf course as can be found were soon established. The Country Club, with a membership now of 2500 and a long waiting list, subsequently bought the property which it had formerly been leasing. The building is perched on the edge of a high bluff, affording a view of hill and valley hardly to be surpassed.

As the Roland Park development began on land situated in Baltimore county, and only a small portion of the park is within the city limits today, there has never been any local municipal government, the County Commissioners having the same control over the park as over the rest of Baltimore county. The citizens of Roland Park incorporated a Roads and Maintenance Corporation that uniquely takes the place of a municipal governing body, looking after the general welfare and good order of the community.

The Roland Park properties have long furnished a model for works of that kind, as they have been an inspiration to individuals and communities everywhere for many years. Many English visitors, as well as a constant stream of people from every part of this country, come to Baltimore to see the city and to inspect and admire the Roland Park plan, and the fame of the development has been spread by all who come.

The Johns Hopkins University is completing the first two of a group of buildings on its new site of 250 acres fronting Charles street, opposite the southern boundary of Guilford, and will here build up one of the greatest universities in the country. In the same vicinity other educational institutions are to be established. Sites have been secured for several costly churches, and one has already been completed, so that incidentally this section promises to become noted for its educational and religious activities.

Work on the first house in Guilford was begun in May, 1913. At the present time there are 85 houses completed and under construction, which represents an outlay of over \$1,285,000. The Roland Park Company has already spent at Guilford over \$715,000 for development work alone. The improvements in Guilford, up to the present time, represent an outlay of about \$2,000,000.

In Roland Park there are now 571 houses, which represent an outlay, for houses alone, of approximately \$7,000,000. This territory has a population of about 3600.

When the Roland Park-Guilford District is fully developed it is estimated that it will have a total population of about 15,000 in its "Thousand Acres of Restricted Land," with an outlay by the Roland Park Company and lot owners for land, development and houses of upwards of \$40,000,000.



STORE BLOCK IN ROLAND PARK, WITH TYPICAL SETTING OF TREE AND HEDGE

Arundel Sand and Gravel Company

A Baltimore Concern That Has An Extensive Trade Territory Reaching As Far South As Tampa, Florida

IN the building activities and the great constructive work of all kinds under way in and around Baltimore there has been created a demand for construction materials, heavy and continuous.

The facts given in this issue in regard to the extent of these construction activities are so surprising that with the permission of the Manufacturers Record we are able to present here a few of these remarkable figures.

In the last ten years nearly \$170,000,000 have been expended in house construction within the city limits, and a good many millions more have been put into buildings in the suburban districts outside the city limits. In that period Baltimore has built about 23,000 dwellings alone—in itself a city. It has erected many splendid office buildings, fine hotels and churches and a wide variety of structures that go with the growth of a great city, such as this has now become.

At the present time there is in course of construction a paving system which will include every street and alley in the city and represent an outlay of about \$14,000,000.

The city is spending about \$23,000,000 on a sewerage system ranked by engineers as the most modern and up-to-date in the world, and house owners are spending about \$12,500,000 in making connections for the 125,000 houses in the city with this sewerage system.

Into the enlargement of the water supply and the purification of the water \$5,000,000 are being put, while over \$7,000,000 have been spent in the beginning of a municipal dock system.

These things are only indicative of the extent and variety of the building activities which are putting this city to the forefront and which are making certain its destiny as one of the world's great cities.

The railroads terminating here or passing through the city have, during the last five years, been spending many millions of dollars in the enlargement of their shipping facilities, in the erection of great warehouses, as illustrated in one warehouse erected by the Baltimore & Ohio, which is eight stories high and over 1000 feet long, and in the betterment of their track and the increasing of their rolling stock. The Baltimore & Ohio alone, according to a statement recently made by President Willard, has spent \$100,000,000 in the last five years on extensions and betterments.

Out of this remarkable industrial activity there have grown up many enterprises of great importance. One of these is the Arundel Sand & Gravel Co., a Baltimore business institution that has a far-reaching trade territory, gives employment to many and performs a large part in the tremendous amount of constructive work now being carried forward in this city, and which also exerts a distinctive influence upon the same class of work in many other communities.

The average observer who sees a motor-car or wagon load of sand passing through the streets, and who is accustomed to think of it merely as a part of the mixture of mortar to be used in laying brick or plastering a wall, and who thinks little or nothing of the occasional load of gravel now and again hauled by, has little conception of the vast amount of these two materials called into requisition by the modern methods of building construction, road-making, and the erection of bridges, viaducts and causeways. Few people in Baltimore, perhaps, know that a company in this city, engaged exclusively in the sand and gravel business, is capitalized at \$2,000,000, employs hundreds of men, hundreds of horses, many auto trucks, numerous tugs, barges and lighters, and a large amount of electric-driven machinery. Most of the people of the city would be amazed to know that the business done by such company in such ordinary materials as sand and gravel extends over a scope of country reaching 1500 miles, calling for the delivery of its product as far away as Tampa, Fla. Yet these bare facts tell but a small part of the story of the activities of the Arundel Sand & Gravel Co., organized, financed and officered by Baltimore men, and, though but six years old, doing a business with a sweep far wider than that of concerns that have been identified for a much longer period with the city's business life.

The Arundel Sand & Gravel Co. was organized in 1908 as a sort of subsidiary to the dredging operations that formed a part of Frank A. Furst's business activities. In dredging the Patuxent River Mr. Furst had found that the sand and gravel brought up from the bottom were peculiarly valuable in the making of concrete, and that they had a wide sale among concrete contractors who learned of their virtues. To meet the demand for them the Arundel Sand & Gravel Co. was formed. The business grew and expanded to an extent not foreseen by its founders, and inside of five years it became

apparent that in order to properly care for the expansion the company would have to be reorganized upon a much broader basis. This great expansion in business had been brought about to a large extent by the continually enlarging use of concrete in the paving of streets, the erection of big factory buildings and business blocks, and in the construction of the larger classes of structures generally. The reorganization was made in 1913, and it was upon a scale that contemplated with assurance the still larger demands that would attend upon the continually increasing use of concrete as a building material. The capital stock was placed at \$2,000,000, of which \$1,000,000 is represented by preferred stock and \$1,000,000 by common stock. Rapid as had been the growth of the company's business under the old organization, and great as had been its increase, it has since grown to much larger proportions, and seems destined to increase much further.

Having tested the virtues and established a demand for the sand and gravel pumped up from the bottom of the Patuxent, the company sought and found a large area of land bearing the same quality of those materials, and succeeded in purchasing 700 acres underlaid with them. This boundary comprises the old hospital store ground in Anne Arundel county, lying between the drawbridge and the city property, where, during the ages, hundreds of thousands of cubic yards of sand and gravel had been deposited to await the time when they would be called forth to serve the purposes of man. Here docks have been built and machinery installed for taking up the sand and gravel and loading it on lighters and in barges and other vessels for transportation to the various points of distribution and utilization established by the company.

The chief distributing point is at Pier 2, just off Pratt street, where a large concrete building two stories in height has been erected and fitted up both to house the operating offices of the company and to furnish bins for the sand and gravel. On top of this building is an electrically operated derrick, which takes up the sand and gravel from the lighters moored alongside the building and transfers them with great speed to the bins prepared for their reception. This great derrick, traveling from end to end of the building, can reach with its long arm over every portion of it, and across the entire width of the lighters that come laden to its one side, as well as to the street cars that come upon the tracks that lie upon the other, and are there loaded. Under the storage bins are driveways for wagons and other vehicles, which are easily and quickly loaded by means of chutes or spouts from the bins. Here also are installed screens for the separation of the gravel into various sizes, so as to adapt it to the kind of work for which it may be wanted. In fact, the entire equipment is such as makes for the speediest and most economical handling of the company's business.

At the foot of Fell street the company has another plant for the distribution of its product. This plant also is well equipped for the handling of business, having a stationary derrick for unloading vessels and placing the materials in convenient reach of the distributing vehicles.

In addition to these stationary plants the company has four floating derricks for use in loading railroad cars, barges, steamers and schooners with sand and gravel intended for use at distant points. These derricks are taken from place to place in the harbor as the work demands, and are of unsurpassed utility in the expeditious and economical handling of the company's business.

Other equipment owned and operated by the company comprises four tugs and sixty lighters. These are used in towing and carrying its products from the pits to the points of distribution. Of the lighters, by the way, two are built of concrete, probably the first of the kind to be used anywhere in the world. These lighters are of 500 tons capacity, and in the two years during which one has been in use, and the year's life of the other, they have been found entirely satisfactory.

For use in supplying local customers the company has 100 head of horses and the wagons and equipment that go with them, and four large auto trucks, besides which hundreds of other teams and trucks belonging to building contractors and contracting haulers are employed daily in transporting sand and gravel from the plants to the many points throughout the city at which they are to be used.

Taken all in all, there is probably no concern engaged in the sand and gravel business anywhere in the country that is better equipped for handling large amounts of these materials in a short time, and there are few, if any, that do a larger aggregate business than is done by this Baltimore company.

There is no other, indeed, that has a business carrying over such an extended territory.

The Arundel Sand & Gravel Co. sends its product to a large number of points on the South Atlantic seaboard, and even to a number on the coast of the Gulf of Mexico. Among its regular patrons are builders and contractors in Norfolk, Portsmouth, Newport News and Richmond, Va.; Newbern and Wilmington, N. C.; Charleston, S. C.; Savannah, Ga.; Jacksonville, Key West, Boca Grande and Tampa, Fla. Through these ports the products are sent to a large number of interior points for use in constructive work.

During the construction of the famous "Over-Sea" extension of the Florida East Coast Railway across the Florida Keys from the mainland to Key West, where concrete arch bridges were built for miles over the water, this company furnished hundreds of thousands of cubic yards of sand and gravel from its Patuxent pits to go into the great work. It is estimated that the Arundel

reliable and enduring of materials for the construction of large buildings by those Baltimoreans engaged in the erection of big business houses and manufacturing plants of various kinds gives assurance of a large and constantly increasing trade in sand and gravel for the future. So the business of this company will unquestionably experience a steady and continued growth.

No section of Baltimore in these busy days presents a scene of greater activity than is to be witnessed about the distributing plants of this company, when scores of vehicles, ranging from the one-mule cart through two and three-horse wagons to powerful auto trucks, are seen in line moving in for loads, which are quickly secured, and then passing on out and heading in different directions to the various points of delivery. If there were a shortage of supply for a time, or a disarrangement of machinery, in a few minutes there would be such a congestion of vehicles as to impede the ordinary traffic on the streets of approach. The layman looking on for a time is led to wonder



RECEIVING AND DISTRIBUTING PLANT ON MUNICIPAL PIER 2.

Sand & Gravel Co. furnished half the sand and gravel used in the construction of that marvel of railway enterprise, which stands alone in the matter of bridge building, unapproached as a piece of daring and successful constructive engineering. The company is still sending other hundreds of thousands of yards for use in the permanent structures that are being put in to take the place of a large amount of temporary work.

The materials sent to these far-away points are transported in steamers, schooners and barges.

Locally the demand for sand and gravel is very large at this time, and the outlook is promising for a greatly increased demand in the future. Much of the present demand comes from the very large amount of street paving now under way in Baltimore, and as this work embraces the paving of every street and alley in the city with material that calls for a concrete base, that class of construction alone will call for a large amount of sand and gravel for several years to come. Then, the general adoption of concrete as the most

where there can be a call for so much sand and gravel as he sees moved from one of these plants in course of a half hour's watching.

The Arundel company, in addition to its superb service, which assures quick delivery, maintains the policy of keeping its prices low, so that its patrons are bound to it by firm ties, and its trade is made secure. Its profits come from the volume of business transacted, rather than from a large percentage on a small amount of material sold.

The officers of the Arundel Sand & Gravel Co. are Frank A. Furst, president; Joseph J. Hock, vice-president and general manager; W. Bladen Lowndes, secretary and treasurer. The directorate consists of these gentlemen, together with Walter B. Brooks, T. Edward Hambleton, Michael T. Horner, Colin McLean, T. Wallace Lanahan, George F. Whiting, R. Lancaster Williams, all of Baltimore, and William Maloney of Wilmington, Del.

Most of these gentlemen are widely known in connection with various other enterprises of far-reaching importance, and are reckoned among the community's most substantial and progressive citizens.

MERCHANTS-MECHANICS NATIONAL BANK

OF BALTIMORE

Capital, \$2,000,000

Deposits, . \$18,000,000

Surplus, 2,000,000

Total Assets, 24,000,000

DOUGLAS H. THOMAS, President

JOHN B. RAMSAY, Vice-Pres., Chairman of the Board
WILLIAM INGLE, Vice-PresidentJOHN B. H. DUNN, Cashier
CHARLES HANN, Asst. Cash.J. CLEVELAND WANDS, Assistant Cashier
ROBERT A. WELSH, Assistant Cashier

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The MERCHANTS-MECHANICS NATIONAL BANK of Baltimore, with its large resources and ample facilities for the prompt and direct dispatch of business, invites the interest of those desiring to deal with a banking institution able to care for the wants of depositors both large and small.

Merchants and others handling out of town trade are asked to consider the advantages attaching to the direct dispatch of their checks and collection matter with the view of effecting prompt settlement. A draft forwarded direct is very frequently paid at the expense of one reaching its destination through roundabout channels.

Approved paper discounted upon application.

Interviews and correspondence solicited.

Depository of the United States, State of Maryland, and City of Baltimore



INCORPORATED 1854

Central Savings Bank

of Baltimore

S. E. Cor. Charles and Lexington Sts., Baltimore Md.

ASSETS			
Invested in Bonds	-	-	\$6,520,239.92
Mortgage Loans	-	-	2,332,770.00
Collateral Loans	-	-	603,802.06
Bank Building and other Real Estate	-	-	242,244.04
Perpetual Insurance Deposits	-	-	850.00
Cash on hand and in Banks	-	-	448,463.69
			\$10,148,369.71

LIABILITIES			
Due Depositors	-	-	\$9,092,496.77
Guarantee Fund	-	-	875,595.98
Undivided Earnings	-	-	180,231.96
U. S. Government Income Tax Accounts	-	-	45.00
			\$10,148,369.71

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JAMES D. GARRETT, Asst. Treasurer

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Absolute Protection**Prompt Service****Reasonable Rates**

Capital Paid in Cash
\$2,000,000



Total Resources Over
\$8,000,000

UNITED STATES FIDELITY AND GUARANTY CO.,

BALTIMORE, MARYLAND.

ISSUES

JUDICIAL
 CONTRACT
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 BANK
 INTERNAL REVENUE
 AND
 CUSTOMS

BONDS



HOME OFFICE

ISSUES

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 BURGLARY—PLATE GLASS
 PHYSICIANS, DENTISTS AND
 DRUGGISTS LIABILITY
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 GENERAL LIABILITY
 ELEVATOR—TEAMS
 AUTOMOBILE
 WORKMEN'S COLLECTIVE AND
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**Offers to Merchants the Best Possible Protection
 Through its Department of Guaranteed Attorneys**

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Safe Deposit and Trust Co. OF BALTIMORE

13 South Street

ORGANIZED 1867

Capital, Surplus and Undivided Profits Over \$3,000,000

Acts as Trustee of Corporation Mortgages, Fiscal Agent for Corporations and Individuals, Transfer Agent and Registrar. Depositary under plans of reorganization.

Acts as Executor, Administrator, Guardian, Trustee, Receiver, Attorney and Agent, being especially organized for careful management and settlement of estates of every character.

One-story Fireproof Building with latest and best equipment for safety of contents.

Safes for rent in its large fire and burglar proof vaults, with spacious and well-lighted coupon rooms for use of patrons. Silver and other valuables taken on storage.

Securities held on deposit for out-of-town corporations and persons.

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MARYLAND TRUST COMPANY

BALTIMORE

Your Baltimore representative will find that we will make
favorable terms for your account

Prompt returns on Collections

ACCOUNTS AND BUSINESS OF CORPORATIONS, MERCHANTS, FIRMS, INDIVIDUALS,
BANKS AND TRUST COMPANIES DESIRED

SAVINGS DEPARTMENT

GOOD SERVICE

CONSIDERATE TREATMENT

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DEPENDABLE

PERPETUAL

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ACTS IN ALL FIDUCIARY CAPACITIES FOR CORPORATIONS AND INDIVIDUALS.

A THOROUGHLY MODERN BANKING DEPARTMENT.

ARMOR PLATE SAFE DEPOSIT VAULT—ONE OF THE STRONGEST IN THE WORLD.

CAPITAL AND SURPLUS, \$2,700,000

Eutaw Savings Bank of Baltimore

(INCORPORATED 1847)

S. W. Corner Eutaw and Fayette Streets

JANUARY 1, 1914

Funds, \$28,036,302.28

Accounts, 45,808

A Mutual Bank Without Capital Stock for the Encouragement of Savings

Interest
at the
rate of
 $3\frac{1}{2}\%$
per
annum



EUTAW SAVINGS BANK OF BALTIMORE

Open
10 A. M.
to
3 P. M.
—
Saturdays
10 A. M.
to
1 P. M.

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ACCOUNTS MAY BE OPENED BY MAIL

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HOME OFFICE, BALTIMORE.

These Buildings are Typical of the GROWTH in STRENGTH & STABILITY of the Fidelity and Deposit Co. of Maryland

FIRST HOME
Dec. 31, 1890
Assets, \$148,499.44

SECOND HOME
Dec. 31, 1894
Assets, \$823,591.52

PRESENT HOME
June 30, 1914
Assets, \$11,730,107.54

The Strongest Surety and Casualty Company in the world.

The first company to qualify on the bond of a United States Government official.

The first company to qualify on the bonds of public officials of States, Counties and Municipalities throughout the United States.

It has over seven thousand agents and attorneys.

It has a representative in every county seat and important municipality and town in the United States.

It is international in its scope and can furnish bonds in Great Britain and Ireland, the British Colonies throughout the world, Germany, Russia, Austria-Hungary, Holland, France, Italy, Cuba and Porto Rico.

It is noted for its prompt adjustment of losses and for the splendid facilities it affords for the furnishing of surety guarantees.

FIDELITY and DEPOSIT CO.

OF MARYLAND

EDWIN WARFIELD, President
BALTIMORE

DROVERS & MECHANICS NATIONAL BANK OF BALTIMORE

Resources	\$8,800,000
Capital Paid In	\$300,000
" Earned	300,000
Surplus and Profits Earned	550,000

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ROBERT D. HOPKINS, Vice-Prest.	LESTER WALLACE, Asst. Cashier
EDWIN P. HAYDEN, Cashier	EDWARD W. TALBOT, Asst. Cashier
HERBERT H. OWENS, Asst. to the Prest.	

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Charles Adler	Samuel Rosenthal
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Dr. M. H. Carter	Geo. W. Atkinson
Hamilton G. Fant	Herbert H. Owens

Splendidly equipped to handle out-of-town accounts, as well as local.

Your account carried with a solid, conservative yet progressive bank adds prestige to your name.

High-Class Business Stationery STEEL DIE EMBOSSED

Get all the prestige possible from your business stationery. For sales letters or your regular correspondence Engraved Stationery will pay you dividends in attention secured for your proposition.

High-class stationery is responsible for much of the success of large users of letter campaigns, and the slightly higher initial cost is more than offset by the much larger percentage of inquiries and orders received.

Special semi-business size is popular with professional men, executives, municipal, state and county officials.

Write for samples.

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641 COLUMBIA AVE.

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Office, Bank and Lawyers' Supplies

"Buy of the Maker"

We make all kinds of Burning Brands, Steel Dies, Distillers' Stencils and Printing Wheels, Seals for Corporations and Churches, Stock Certificates, Brass Signs, Memorial Plates, and all kinds of Engraving under personal supervision

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526 N. CALVERT ST.

BALTIMORE, MD.

First National Bank

BALTIMORE, MD.

RESOURCES, - TEN MILLIONS

Our extensive patronage of today is an eloquent tribute to FIFTY YEARS of courteous, conscientious service.
Your business invited.

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S. W. TSCHUDI, Asst. Cashier	R. E. BOLLING, Asst. Cashier

THE OLD TOWN NATIONAL BANK

Gay and Exeter Sts. BALTIMORE, MD.

CAPITAL, \$250,000.00	United States and City Depository	SURPLUS AND PROFITS, \$120,000.00
	AVERAGE DEPOSIT, \$1,600,000.00	

JACOB W. HOOK, President	HENRY O. REDUE, Vice-President and Cashier
AARON BENESCH, Vice-President	F. M. MILLER, Asst. Cashier

NELSON, COOK & Co.

German Street
Corner Calvert

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Municipal, Railroad and Public Service Bonds
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Reduce Insurance Rates. Approved by the National Board of Fire Underwriters.
Write for Catalogue.

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Watchman's Clocks, Time Recorders, Factory Clocks, Fire Extinguishers, Etc.

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Baltimore

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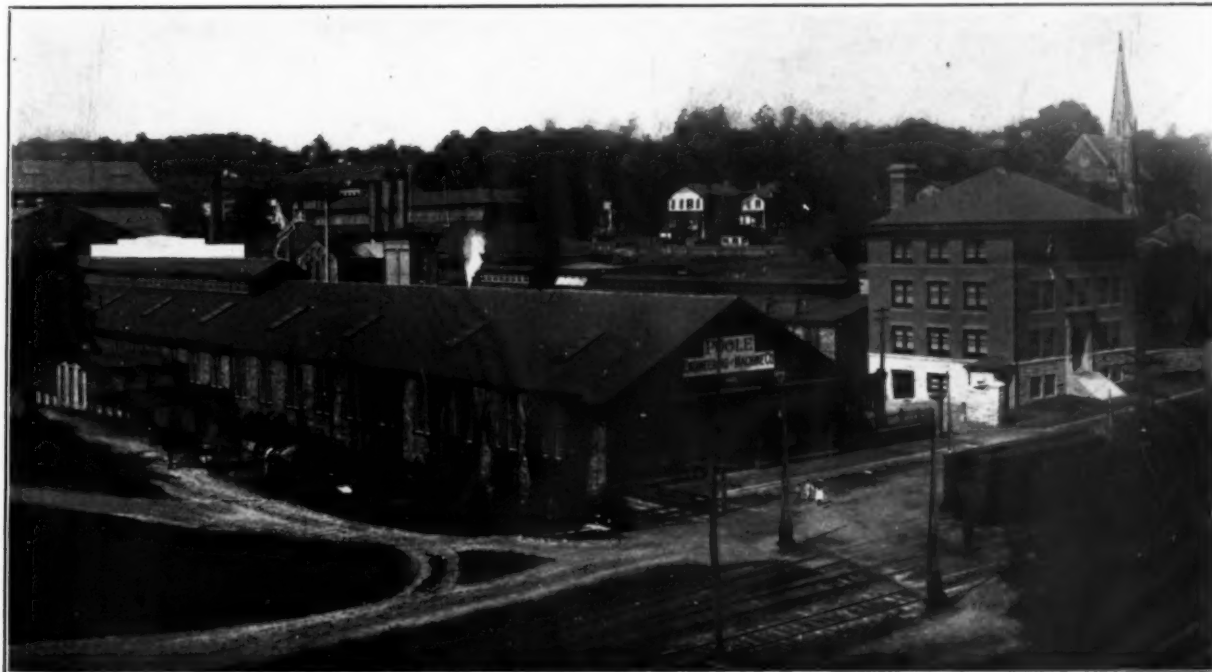
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Power Transmission Machinery, Shafting, Pulleys and Hangers

Heavy Charcoal Gun Iron or Semi-Steel CASTINGS

28,000 TO 30,000 POUNDS TENSILE STRENGTH



A PORTION OF THE LARGE PLANT

GEARS—Machine Molded or Cut

Made of Best Grade CHARCOAL GUN IRON OR SEMI-STEEL
ROLLING MILL AND PLATE GLASS MACHINERY

FERTILIZER MACHINERY

Mixers with Overhead Drive, Double Stirrers, Pans, 6' 0" diameter, 24" deep.
Bagging and Mixing Machines. Phosphate Rock Crusher.
SPECIAL HEAVY MACHINERY BUILT ON CONTRACT

HOTEL BELVEDERE

Charles at Chase Street, Baltimore, Md.

EVERY feature that makes for Twentieth Century Service and Convenience can be found at the Hotel Belvedere. It is admirably situated on the highest elevation in Baltimore, right in the heart of the city's fashionable center, three blocks from the famous Washington Monument. It is convenient to all theatres and other amusement places, and within a delightful ten minutes' walk of the retail shopping district. Direct car lines to all the railway stations and steamship landings pass the hotel, and a superior taxicab service is always at your command.

THE Hotel is absolutely fire-proof, and offers accommodations for 600 patrons. The twelfth floor contains Ball Rooms and Assembly Rooms. On the main, or street floor, will be found the Restaurant, Garden, Tea Room and Cafe. Pure artesian water throughout the house from our well 1000 feet deep. No effort has been spared to provide efficient service. The surroundings are refined, comfortable and luxurious, with an atmosphere of hospitality. The desire of the management is to cater at all times, and in all ways, to the comfort of its guests. Distinctive Cuisine. White Service Throughout.

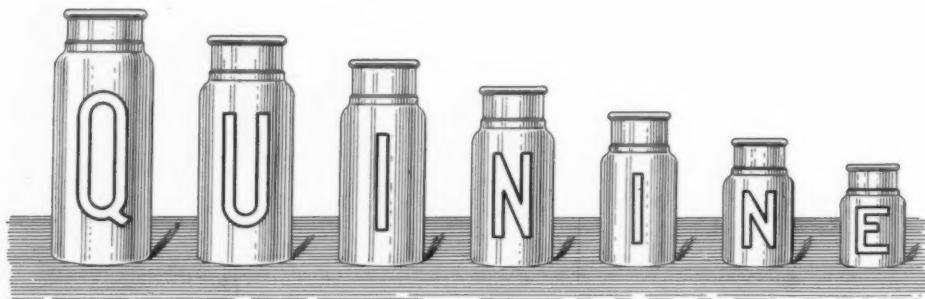
ALL ROOMS FACE OUTSIDE

RATES

Single Room with Bath for 1 person, per day . \$3, \$4, \$5
Double Room with Bath for 2 persons, per day \$5, \$6, \$7
Twin Beds in Rooms \$1 per day extra
Suites of Parlor, Bed Room and Bath,
per day \$10, \$12, \$15
Larger Suites in proportion.



OUR "ROYAL BLUE" LINE OF QUININE BOTTLES



You Will Find Our Prices Satisfactory

As a Container for Quinine, our "Royal Blue" Bottles, with a lustre of peculiar brilliancy, are unsurpassed. Then, too, they are made on the OWENS AUTOMATIC MACHINE—one of the marvels of modern engineering—which insures uniform corkage and capacity.

In addition, we manufacture in blue glass, all other styles of bottles.

Our Mould Shop, with its modern machinery and skilled workmen, enables us to execute orders for special designs quickly, and at minimum cost.

BALTIMORE HAS UNSURPASSED SHIPPING FACILITIES

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We recommend Asbestos Built-up Roofing for permanent service on large, flat surfaces, such as factory and warehouse buildings. An all-mineral roof, requiring no slag or gravel to protect it. No nail holes or exposed laps to cause leaks.

We use the Kearsbey & Mattison Company's Asbestos felts and the Barber Asphalt Paving Company's genuine Trinidad Lake Asphalt Roofing Cement, recognized everywhere as standard.

We also furnish and apply coal-tar slag or gravel roofs, K. & M. Asbestos Ready Roofing and other prepared roofings where required.

Waterproofing and Mastic Floors

The right kind of materials PLUS the *know-how* insures permanent results. The benefit of our many years' experience costs you nothing extra. If your problem is difficult, don't hesitate to ask our advice.

Pipe and Boiler Covering

Real *efficiency* requires high-grade insulation, APPLIED RIGHT. Our workmanship is of the same high character as the materials we use—none better.

Get Our Prices Before Closing

Contracts promptly executed from Maryland to the Carolinas—or farther.

CHESAPEAKE

Roofing & Pipe Covering Co., Inc.

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30 Light Street
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Oils, Paints and Varnishes

and Proprietors of

MACNEAL'S VARNISH AND COLOR WORKS

Calvert Brand Dry Mortar Color

RUBBER PAINT COMPANY

Only Makers of Black RUBBER ROOFING PAINT

Offices and Works

WARNER AND WOOSTER STS.

BALTIMORE, MD., U. S. A.

"HOUSE OF MACNEAL"

We manufacture and install Low Power Dust Collecting Systems

for PLANING MILLS

FURNITURE FACTORIES

SAW MILLS

PULP MILLS

TANNERIES

SHOE FACTORIES

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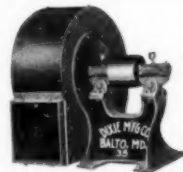
POLISHING AND BUFFING ROOMS

and other factories where Dust Producing Machines are operated.

WRITE FOR ESTIMATES

Dixie Manufacturing Co., Inc.

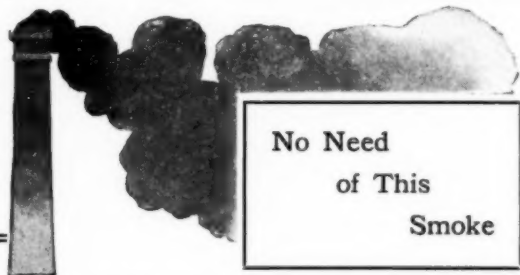
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Boston Iron and Metal Company

PRATT AND FREMONT STREETS
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Plants Bought and Dismantled



No Need
of This
Smoke

THE HUBER HAND STOKER

Increases the efficiency, capacity and profits of your Plant. Practically solves the smoke problem.

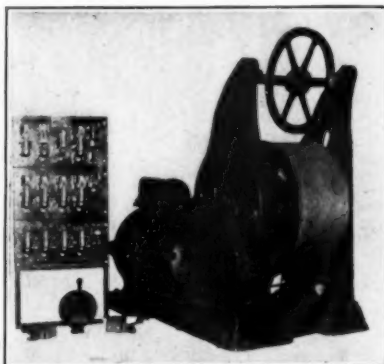
Uses ALL of the coal. Partly burned coal or clinkers cannot mix with fresh coal. No sluicing required. Will burn any kind of coal. Less coal will give more steam and more power.

Write for Huber Hand Stoker Data

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Electric: Passenger and Freight. Electric and Hand Power Dumb Waiters. Hand Elevators. Hydraulic-Electric and Hand Power Basement Hoists.



In Business Twenty-five
Years. In Baltimore and
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Recommended everywhere by Archi-
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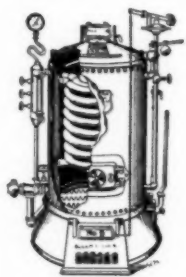
Highest Efficiency
Greatest Economy

Write for Catalog and Prices
Estimates Cheerfully Furnished.

Warsaw Elevator Co.

T. FRANK WILHELM
Mercer, Grant and Water Streets
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STEAM — HOT WATER — VAPOR
VACUUM HEATING

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OYSTER STEAMERS
Automatic Gas Water Heaters
GARAGE OIL PUMPS

MONITOR HEATING CO.

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Easley Cotton Mills	Eureka Cotton Mills
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Sheetings Shirtings Drills Fine Cloths Outing Cloths

Arundel Double and Twist Filling
Ounce Duck

8, 10, 12 Oz., 29 Inches Wide



SAIL DUCK

Wide Cotton Duck

United States Army Duck

28½-inch U. S. A. Standard Duck

DIETRICH BROTHERS

Iron and Steel
Structural Work Steel Buildings
Ornamental Iron Work
Stairways Elevator Fronts
Pavement Lights

STEEL BARS AND WIRE MESH FOR
CONCRETE REINFORCING

WILL CUT THE FOLLOWING TO
ANY LENGTH UP TO 60'-0":

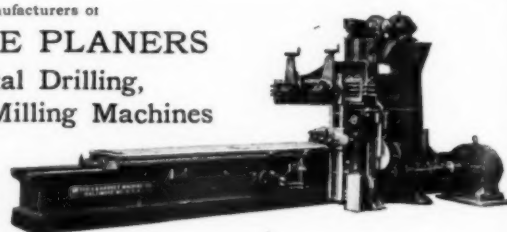
Beams Channels Plates Angles and Bars

BALTIMORE, MD.

Manufacturers of
OPEN SIDE PLANERS
Horizontal Drilling,
Boring and Milling Machines

ALSO

Special Machinery
built to order



We are exceptionally well equipped for cutting bevel and spur gears. Send us your inquiries.

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Detrick & Harvey Machine Company
BALTIMORE, MD.

Our Business Is To Manufacture
MACHINERY



—SUCH AS—

Gas Engines — Automobile Accessories —
Moving Picture Machines—Shoe Machinery
—Wood Working Machinery—Automatic
Devices, etc.,

In Quantities

For people who wish to deal in these articles, but do not wish to tie up their capital or time in a manufacturing plant. By combining the manufacture of many articles under one management, the cost of production, including our profit, is less than the cost of producing an inferior article in small individual shops.

Call and go over our plant.

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MANUFACTURING SPACE FOR LEASE with Heat, Passenger and Freight Elevator
Service, Sprinkler System, and Watchman's Service.

Low Cost Current and Live Steam from the Building's Own Power Plant



An Entire City Block at the
Water Front

Floor Area, 636,000 Square Feet

Designed and erected to meet the requirements of manufacturers who seek floor area permitting most economical manufacturing cost, superior natural light, ideal shipping facilities; fireproof, sanitary and healthy surroundings for employees.

Descriptive booklet mailed upon request.

WM. MARTIEN & CO.

3 N. Calvert St.

Baltimore, Md.

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THE INDUSTRIAL BUILDING, 501-9 E. PRESTON ST.

Ready for Immediate Use

MANUFACTURING SPACE IN

The Industrial Building

BALTIMORE

THE BUILDING OFFERS

First class facilities without capital expenditure. Keep your capital at work. Put it in your business, not in a building.

Cheap power—the rates for electric power in Baltimore average less than those of any other City on the Atlantic Seaboard.

Lowest Insurance Rate in Baltimore. No wood used in construction of the building.

Ample elevator service—8 electric elevators for passengers and freight. Two freight halls.

Abundant light—55% of the wall space is glass.

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H. G. BISHOP, Manager

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Engines, Boilers, Pumps, &c., Pipe, Fittings and Supplies

Machine and Pipe Work a Specialty

WALLACE STEBBINS & SONS

CHARLES and LOMBARD STREETS, BALTIMORE

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BALTIMORE, MARYLAND

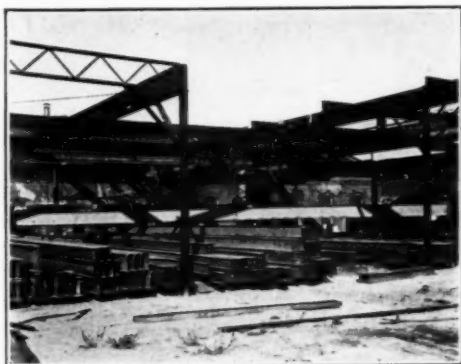
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Locomotives	Crusher and Pulverizers	Concrete Chutes
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GOOD ROADS MACHINERY AND EQUIPMENT
NEW AND SECOND HAND



VIEW OF STOCK YARD

Listen! Contractors, Architects, Owners!!

No matter what you want, if it is anything in the line of

STRUCTURAL STEEL

— AND —

ORNAMENTAL IRON

Get our quotations first. Nothing is too large or too small for us to handle in a manner satisfactory to you.

CHESAPEAKE IRON WORKS, BALTIMORE, MD.



Poplar logs being loaded on Eagle Creek, Swain County, N. C.



The Same Logs On Way to the Mill

HARDWOOD LUMBER

Manufacturers and Distributors

R. E. WOOD LUMBER CO.

HEADQUARTERS

Continental Building, Baltimore, Md.

Manufacturing Plants: WEST VIRGINIA, TENNESSEE AND NORTH CAROLINA

YELLOW POPLAR
CHESTNUT
WHITE OAK

WHITE PINE
BIRCH
WHITE ASH

HARD MAPLE
BASSWOOD
HEMLOCK

The accompanying illustrations are typical of the vast lumber operations conducted by the R. E. Wood Lumber Company, and their allied companies, in the heart of the Appalachian Mountains, where they have abundant supply of virgin timber of the varieties mentioned above.

The entire output of this company is produced by the best band mill equipment, and extreme care is taken in the manufacturing and preparation of the lumber for the market.



Logs at log basin and Band Mill at Mouth of Eagle Creek



Section of Lumber Yard, Eagle Creek

MORGAN MILLWORK COMPANY

WHOLESALE JOBBERS

OF

Sash, Doors, Blinds

Molding

Porchwork, Etc.

Manufacturers of

Morgan Perfect Hardwood Doors

BALTIMORE, MARYLAND

Utility Manufacturing Company

Makers of

WIRE, TIN AND METAL SPECIALTIES,
DIES AND MODELS

FLOUR SIFTERS, SINK STRAINERS, TEA AND
COFFEE STRAINERS

Give us an opportunity to estimate on your
tin or wire novelties

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PAINTS
BRUSHES
VARNISHES
MIRRORS

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PITTSBURGH PLATE GLASS COMPANY

310, 312, 314 W. PRATT STREET

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Cincinnati, O.—Broadway and Court Sts.
New Orleans, La.—Girod and Commerce
Sts.
Memphis, Tenn.—23 S. 2d St.
St. Louis, Mo.—Cor. 10th and Spruce Sts.
New York, N. Y.—Hudson and Vandam
Sts.
Brooklyn, N. Y.—Third Ave. and Dean St.
Buffalo, N. Y.—372-74-76-78 Pearl St.
Boston, Mass.—39-103 Portland St.
Pittsburgh, Pa.—101-103 Wood St.
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Detroit, Mich.—53-59 Larned St. East.
Grand Rapids, Mich.—45-47 N. Division Ave.
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Rochester, N. Y.—Wilder Bldg., Main
and Exchange Sts.
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Omaha, Neb.—1101-1107 Howard St.
St. Paul, Minn.—459-461 Jackson St.
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Havenport, Ia.—410-416 Scott St.
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Ave.
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POPLAR, ASH

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INSPECTOR TO SHIPPING POINT AND
PAY SPOT CASH AS LUMBER IS LOADED

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Continental Bldg.

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G. FRED KRANZ, President

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BALTIMORE, - MARYLAND

It will pay you to visit our warehouses and examine our
well assorted stock of

Chickering, Bradbury, Everett **PIANOS**
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Complete Stock of Sheet Music and Musical Merchandise
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Established 1815

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IN ANY QUANTITY

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Special attention paid to mill shipments

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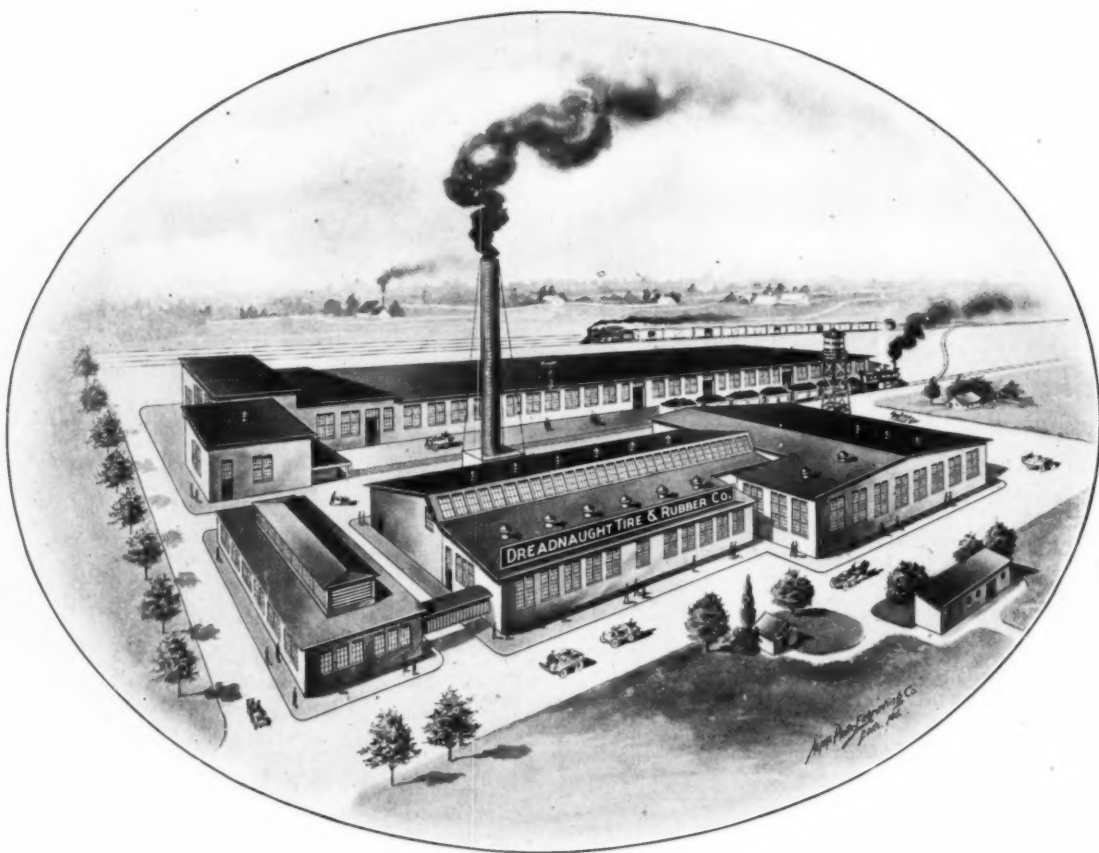
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Sample Trunks and Cases
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DREADNAUGHT AUTOMOBILE TIRES

Since its inception the output of the Dreadnaught Tire & Rubber Company has been oversold. The high quality of these tires has created such a demand as to necessitate the enlarging of our present plant.

THE DREADNAUGHT TIRE

Embodies every feature and improvement that experience and scientific tests have shown to be of value in automobile tire construction.

It contains the highest grade of pure UPRIVER FINE PARA RUBBER, the finest quality of SEA ISLAND COTTON FABRIC, double frictioned, heavy pure gum cushion, single cure molded tread and the patented Dreadnaught Vacuum Tread nonskid, that has the grip to it.

Thus a tire has been produced "Built to Conquer," in which there is no part to "give away first," a tire designed and built for maximum service and whose death notice reads "accident" or "old age."

We are now arranging for the sale of our increased output for the Fall and 1915, and have an exceptionally attractive exclusive agency proposition to offer. Prices, discounts and terms on application.

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General Offices, Munsey Building, BALTIMORE, MD.

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**Brass and Iron Bedsteads
Spring Beds and Cots**

Of Every Description, Sold to the Furniture Trade Only
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The Largest 2nd Hand BAG DEALERS in Baltimore

Dealers in Cotton Baling Cloth, Cotton Seed Meal and Hull Bags
Flour Mills supplied with No. 1 2nd Hand 98-lb. Cottons,
140-lb. Jutes, Bran and Oversacks

We are prepared to contract for the waste burlaps and empty sacks from
Fertilizer Factories and Cotton Mills. Highest Cash Prices.

We have the best equipped factory for the economical handling of 2nd hand
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All correspondence receives prompt attention.

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NEW BURLAP CLOTH FOR BALING PURPOSES. SAMPLES FURNISHED



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of Finest Workmanship

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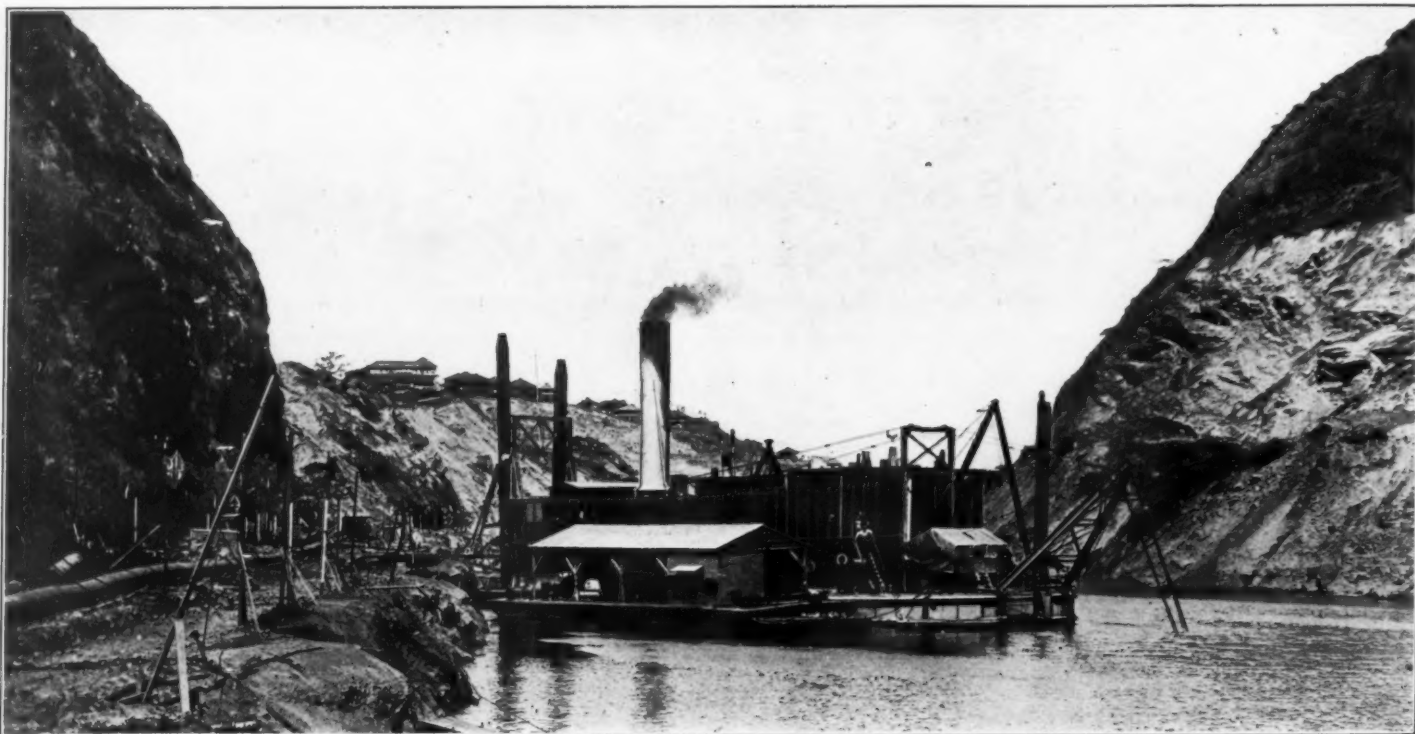
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Isthmian Canal Dredge No. 86, designed and built by the Ellicott Machine Corporation, at work on the northern edge of Cucaracha Slide at the deepest part of Culebra Cut, Panama Canal. This dredge has been giving excellent service in difficult digging of clay and rock. It has pumped coral sand and rock through seven thousand feet of pipe line without a relay.

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Spare parts always on hand for immediate shipment.

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"PERFECT" COMFORT



There's a deal of comfort to any jobber or dealer when he knows that the oil heater he has sold is giving unbounded satisfaction and perfect comfort.

Tell your customers that they can

**CHASE
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CHILL**

from the early morning hours, the cold and damp from the rainy day of summer and fall, and then help to perfect comfort and protection from winter's cold blast. That's the sort of

heater you want to sell. There are 14 excellent numbers in the 1915 line of

Perfect Nesco Oil Heaters

For information write

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A Baltimore concern (now in its fifteenth year) which is supplying feature matter to the better class of publications in forty-seven States, eight Provinces of Canada, and reaching from the Yukon to Australia, from the Philippine Islands to England.

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Established 1899

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WORK THAT SPEAKS FOR ITSELF



Simply four examples of recent work we have done.

We are successfully serving such concerns throughout the North and East.

We want to do likewise throughout the South.

It will be worth your while to consult us when contemplating your next Catalog, Booklet or other printed advertising matter.

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FOR THE
SUCCESSFUL PROMOTION
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If you've the right business, we've
the right kind of printing for your
— ADVERTISING —

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Printing and its branches is our life-work. We have given study and practice to this until we have become masters of the art. We are able, therefore, to go to our customers and offer them our experience and the facilities of one of the finest, most modern and completely equipped plants in the United States.



LITHOGRAPHING. Our aim in this department is *Perfection*. Each division of this work—art, engraving, transfer and press—is an art itself, and it is only natural that when a job is completed, that it should be perfect work, of which we are justly proud. Let us send you samples.

PRINTING. Our superior facilities are such that we are able to print envelopes at the rate of five a second—three hundred (300) a minute. One hundred thousand (100,000) letter heads in one or two colors in eight hours. Our cylinder press department is equipped to do your booklet, pamphlet and catalogue work in neat and efficient order. We have the facilities for printing two colors at one time. With us small orders receive the same careful attention as large ones. Every job in our plant is "big" in importance.

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RULING. When you let us print a book which requires ruling, among other things, we do not have to send it out of the building, to be ruled and bound. It is handed over to our ruling department which is able to take care of it, if it is a small sized note sheet or the largest manifest sheet, records, etc.

EMBOSSING. Having at our command an expert die stamper enables us to make you letter heads, stationery and business cards that will have tone and distinction. Let us send you prices and samples.

Giddings and Rogers Co.

Bank and Commercial Stationers

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BALTIMORE, MD.



J. E. MCGINLEY, President
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WE AIM TO MEET THE FOLLOWING REQUIREMENTS

ACCURACY—SPEED—QUALITY—ECONOMY

— WE SOLICIT ORDERS ON THIS BASIS —

"Best Equipped Printing Office in Baltimore"

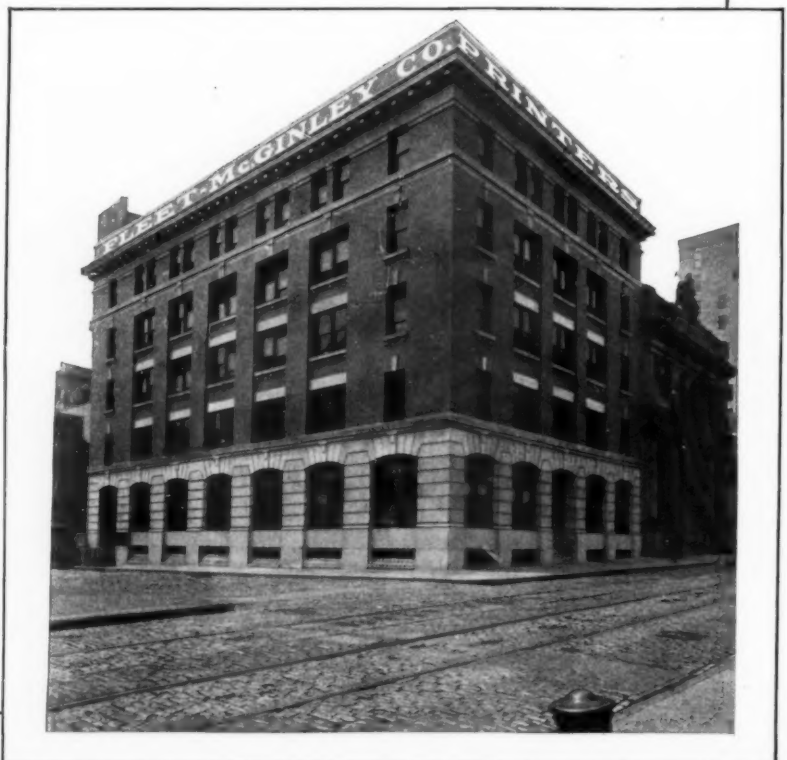
Fleet-McGinley Co.

PRINTERS

N. W. Cor. South and Water Sts., Baltimore, Md.

GOOD PRINTING The character of your printed matter makes an indelible impression—
good or bad—upon those who see it. Our hobby is good printing—not fancy, fussy, printing—but good printing with character, quality and finish—the right type, right stock, right illustrations—all blended into a strong, dignified whole—the kind that will make a *good impression for you*. We will give you the practical thing and it will be of a dignity and style that will please you. We have the equipment; we have the experience, and will deliver the job on time and in perfect order. Give us a chance on your work.

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Printers of the
 Manufacturers Record

"It Looks Worth Reading"

FIRST appearances determine the number of your booklet's readers and effect its results. A booklet's appearance is no better than its paper.

Your catalogue, booklet or folder will have a greater selling force and effectiveness if printed on paper carefully selected for the particular purpose.

CUMBERLAND ENAMEL



HERITAGE BOND

THIS special edition of the *Manufacturers Record* is printed on Cumberland Enamel, chosen from among many other papers, because of its high quality — because of the beautiful results obtainable on its fine surface.

The makers have produced Cumberland Enamel for just such large editions as this issue of the *Manufacturers Record*. Cumberland Enamel is a paper beyond compare for the publicity work of railroads, manufacturers, and large corporations who wish their message to make a favorable impression on a discriminating audience.

The outcome of any job, as far as the paper can influence it, is known in advance where you specify your printer to use Cumberland Enamel.

MAKE your office stationery, letter heads, etc., an advertising asset, instead of an expense item.

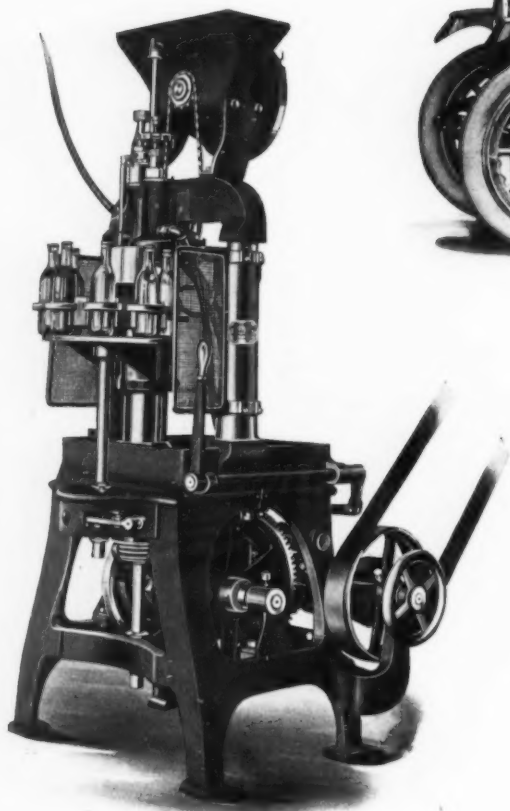
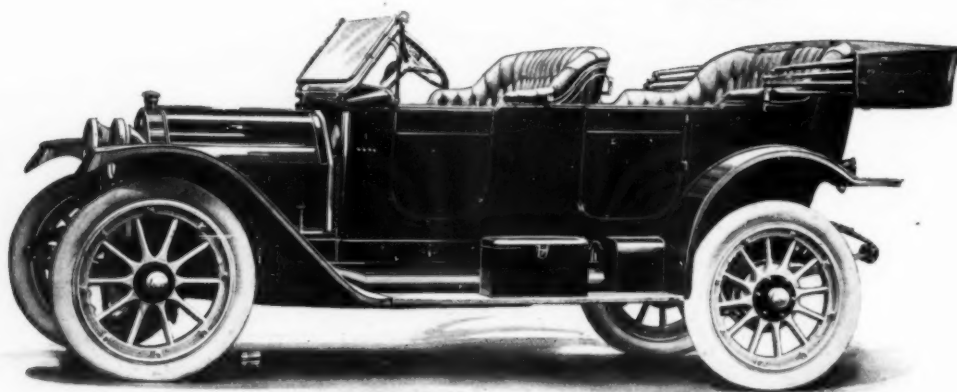
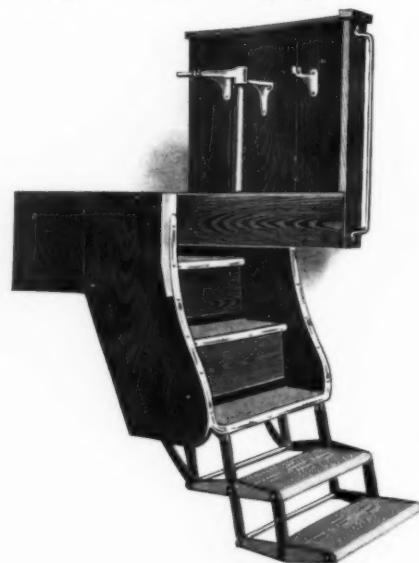
Heritage Bond carries distinction and character wherever it goes; at the same time lessening first costs. It is the best medium priced rag bond paper made.

The best way to know Heritage Bond is to try it. Write us today, giving the name of your printer or stationer, and we will send you a dozen sheets as a trial, without cost.

Smith, Dixon Company Div.
BALTIMORE, MD.

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Engravings for the Printer, Merchant and Manufacturer
If you use Engravings write us today—it will pay

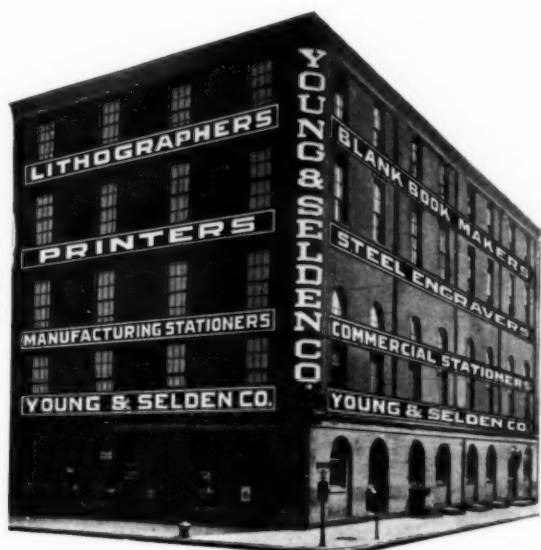


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65,000 Square Feet

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OUR MOTTO—Quality first—Service all the time

We take pleasure
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Cooking
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A first class, modern hotel, located in the heart of Baltimore.

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Very convenient to the entire business section of the city.

Quiet and refined surroundings.

Prices reasonable consistent with good service.

Rates for rooms, \$1.50 per day and upwards.

CUISINE

UNSURPASSED

Room with bath, \$2.00 per day and upwards.

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Fire Protection

Protect your property; the lives of your employes, and reduce your INSURANCE PREMIUMS by equipping with



Automatic Sprinklers

or

Relc Chemical Extinguisher

The installation of Sprinkler Protection has been our business for over twenty-five years.

Let us figure the cost for you.

"AUTOMATIC" SPRINKLER CO. OF AMERICA

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"Quality above Everything"



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"THERE'S MORE TO A FERTILIZER THAN ANALYSIS"

Rubber Belting—



For Power Transmission and Conveying

Belting made by us is constructed from material and in a way that long and varied experience has shown will give the best and most economical service results. We specialize in large heavy belts for power transmission and for conveyors of coal, ores, grain, gravel, sand, cement, etc.

Acquaint us with your requirements.

Hose for Acids, Air, Water, Steam and Suction

Fire Hose—

Cotton, rubber-lined
Linen, unlined

As reliability in time of need is a prime requisite of any fire hose, we devote especial attention to adequate strength and durability of all fire hose we manufacture.

PACKINGS
DIAPHRAGMS

VALVES
TUBING

GASKETS
MATTING



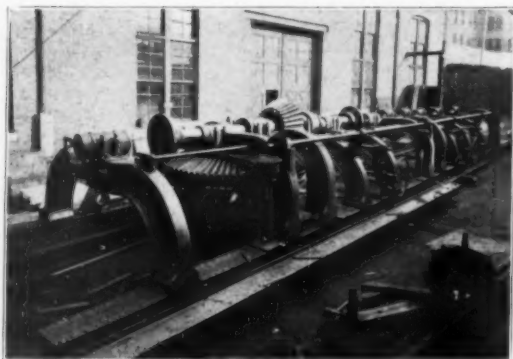
BOSTON BELTING COMPANY

84 Linden Park Street, BOSTON

Carey Machinery and Supply Company, Agents
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The Foremost Line of ELEVATING, CONVEYING AND POWER TRANSMITTING MACHINERY IN AMERICA

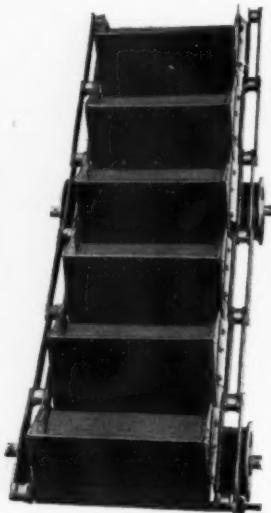


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Arranged to transmit power by ropes or belts to Generator, Line Shaft or other Unit.

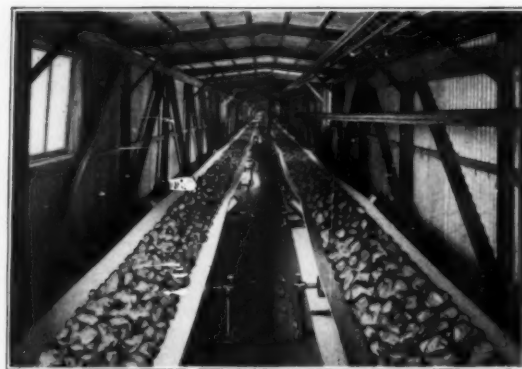
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Describes Our General Line of Machinery



BUCKET ELEVATORS

Built any size chain or bucket up to 84" width of bucket and 36" pitch of chain.



BELT CONVEYORS

For handling coal, sand, gravel, stone, ore, concrete, slag, clay or similar materials.

Catalogue No. B-25

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WELLER MANUFACTURING CO.

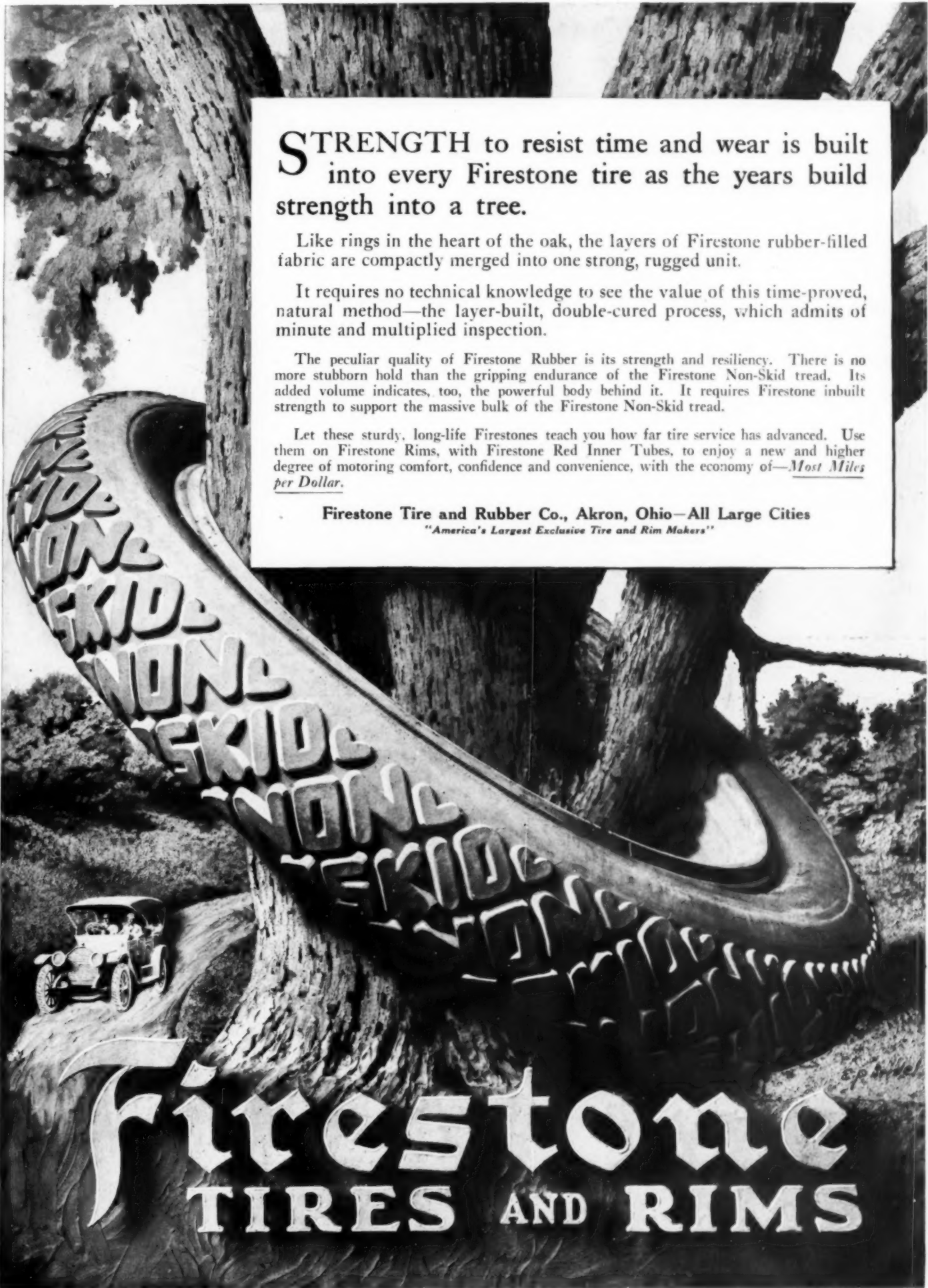
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DEVERELL, SPENCER & CO.

Southeastern Sales Agents

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STRENGTH to resist time and wear is built into every Firestone tire as the years build strength into a tree.

Like rings in the heart of the oak, the layers of Firestone rubber-filled fabric are compactly merged into one strong, rugged unit.

It requires no technical knowledge to see the value of this time-proved, natural method—the layer-built, double-cured process, which admits of minute and multiplied inspection.

The peculiar quality of Firestone Rubber is its strength and resiliency. There is no more stubborn hold than the gripping endurance of the Firestone Non-Skid tread. Its added volume indicates, too, the powerful body behind it. It requires Firestone inbuilt strength to support the massive bulk of the Firestone Non-Skid tread.

Let these sturdy, long-life Firestones teach you how far tire service has advanced. Use them on Firestone Rims, with Firestone Red Inner Tubes, to enjoy a new and higher degree of motoring comfort, confidence and convenience, with the economy of—Most Miles per Dollar.

Firestone Tire and Rubber Co., Akron, Ohio—All Large Cities

"America's Largest Exclusive Tire and Rim Makers"

Firestone
TIRES AND RIMS

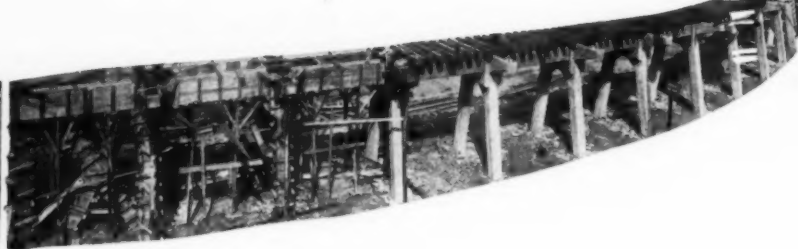
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CONCRETE PILE CO.

HELPING
BALTIMORE
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ORE STORAGE BINS



TRESTLE CONNECTING BINS WITH DOCK



ORE UNLOADING DOCK

DESIGNED AND BUILT FOR

Maryland Steel Co., Sparrows Point, Md.

We design and construct reinforced concrete

Docks, Wharves, Bulkheads, Bins, Walls, etc., etc.

We also place Raymond Concrete Piles for Building Foundations

The Raymond Concrete Pile is placed by means of a collapsible steel mandrel which is encased in a spirally reinforced sheet metal shell. This combination is driven to proper refusal, the mandrel is then collapsed and withdrawn, leaving the shell in the ground. This shell is then filled with concrete, forming a complete pile.

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SUPPORTED ON
RAYMOND CONCRETE PILES



LATROBE APARTMENT

Raymond Concrete Pile Co.

NEW YORK

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OUR SLOGAN:

A FORM FOR EVERY PILE
A PILE FOR EVERY PURPOSE

SUPPORTED ON
RAYMOND CONCRETE PILES



AVON APARTMENT

HAVEMEYER BARS

Were Selected and Used for Reinforcing the Concrete in
Practically All the

Mammoth Municipal Improvements at Baltimore

on which Millions have been spent during
the past eight years

The great sewage disposal plant at Back River; the extensive Fallsway Sewers and roadway. The new Pumping Station, the Valve and Gate Houses at Lake Montebello. The Frederick Road Bridge, and other bridges and culverts for the State Roads Commission, among many other large Baltimore works, are all reinforced with thousands of tons of

HAVEMEYER BARS

These Bars are most effective and most economical for reinforcing all kinds of public and private building and construction work.

Rolled from highest grade billet steel. Round and square sections, weight and area same as plain bars.

Ty chairs, Bar Tys and wire specialties
will tie bars together firmly and save
contractors money.

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Complete stocks in all principal cities





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PAVING ASPHALTS

"BALTIMORE AS IT IS"—a well paved City, a City whose pavements other cities could well afford to pattern after.

For the wonderful record made by Baltimore in the excellence of its asphalt pavements, not a little credit is due STANDARD PAVING ASPHALT, used on many of the heaviest traveled streets.

Charles Street, Monument Street, Frederick Road, Barclay Street, Jefferson Street, Chase Street, are only a few of those streets which are making Baltimore famous, and on which STANDARD PAVING ASPHALT has been used.

It is refined at Baltimore from the best Mexican asphaltic base material, and complies with all tests for a high grade Asphalt.

Detailed tests, specifications and prices on application.

STANDARD OIL COMPANY

BALTIMORE, MD.

(NEW JERSEY)

NEWARK, N. J.



McCulloh Street, Baltimore, Md.

**AZTEC
ASPHALT**



Lanvale Street, Baltimore, Md.



Lanvale Street, Baltimore, Md., Key Monument in Background

Recognition of Merit

MADE IN BALTIMORE

The extensive use of Aztec Asphalt in Baltimore as well as in other parts of the country, including the South, clearly signifies its high merit. In the past year over 750,000 square yards were contracted for in the South alone. It *exceeds* the demands of the Standard Asphalt Paving Specifications, and is the highest quality of natural asphalt obtainable in the American market. Unqualifiedly endorsed by asphalt experts, highways officials, engineers, contractors, etc.

Let us send illustrated booklets and any other information desired. Correspondence invited.



**AZTEC
LIQUID
ASPHALT**



Roads Treated with Aztec Liquid Asphalt in Roland Park, Baltimore

Dust Layer and Surface Preservative

That's the double service given by Aztec Liquid Asphalt. One application will keep a road in proper condition for an entire season. Used with great success throughout the country. Many enduring examples of superiority in and around Baltimore, including that notable suburban development—Roland Park—and Maryland State Highways.

Highly indorsed by authorities.

Detailed information gladly given on request.

The U. S. Asphalt Refining Co.

90 West Street, New York

CHICAGO PHILADELPHIA BALTIMORE NORFOLK MONTREAL

Refineries: East Brooklyn, Baltimore, Md.



Fallaway Viaduct, Baltimore, Md

Corrugated Bars

FOR CONCRETE
REINFORCEMENT

Give perfect bond and assurance of safety and permanency to any structure.

Corrugated Bars Have been used in all types of reinforced concrete construction in the City of Baltimore for a period of more than ten years.

The recent structures indicated by the accompanying list and illustrations are representative of the important work reinforced with Corrugated Bars.

The Filtered Water Reservoir.
Imhoff Tanks.

Sewage Disposal Works.

Jones Falls Diversion Tunnel.

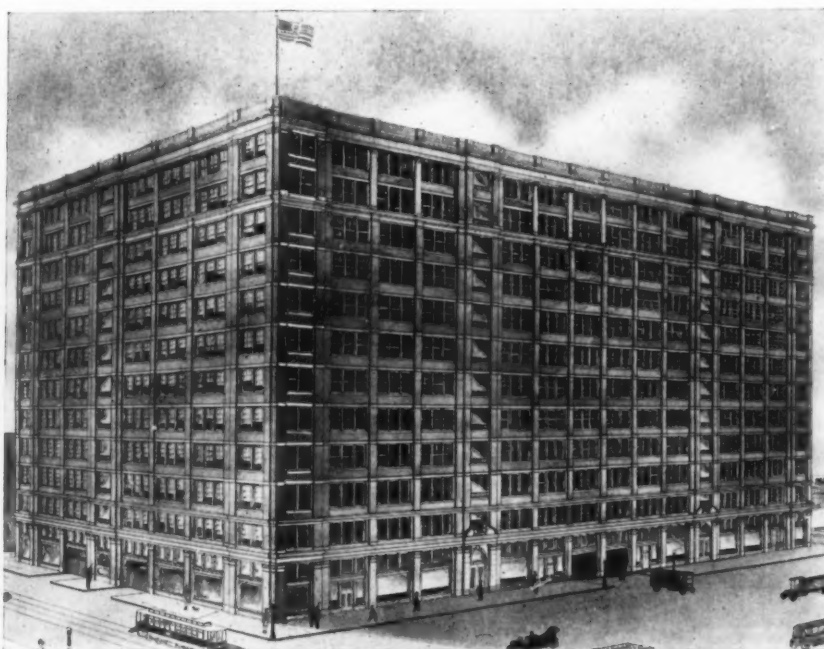
Gilman School.

Bridges and Culverts for State Road Work.

Reinforced Concrete Pressure Water Pipe for the Baltimore Water Supply System.



Recreation Pier, Baltimore, Md.



Coca-Cola Building Now Under Construction, Baltimore, Md

Corrugated Bars Are furnished in both round and square sections in all sizes from $\frac{1}{4}$ " to $1\frac{1}{4}$ " varying by $\frac{1}{8}$ ".

In addition to the best of mill service, any requirement can be promptly furnished from a large general stock at Buffalo, N. Y., or local stocks carried in Baltimore, Md., and other Southern and Southwestern cities.

Corrugated Bar Co.

MUTUAL LIFE BUILDING

Buffalo, N. Y.





PAVING AISQUITH STREET, BALTIMORE, MD., WITH BESSEMER WIRE CUT BLOCKS

PAVING MATERIALS

"BEST BY TEST"

Bessemer Paving Block

DUNN WIRE-CUT-LUG

have been used in more brick paving contracts let by The Baltimore City Paving Commission during 1914 than all other makes combined. Not a car rejected.

Paterson Paving Block

have been used extensively in Baltimore paving work with very satisfactory results.

Allentown Portland Cement

has the distinction of being tested by the Baltimore City Municipal Laboratory with a record of not having a single barrel rejected. This cement is being used extensively in paving work in Baltimore.

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have been used in more than 75% of the paving work done in Baltimore this year.

Ideal Expansion Joint

has been used in more paving work in Baltimore this year than all other makes of expansion joint combined.

Wood Paving Block

manufactured by the United States Wood Preserving Company has been used in more than 90% of all wood block pavement laid in Baltimore this year.

Crushed Rock

for ballast, concrete, asphalt binder, or any other work where crushed rock is required furnished promptly upon receipt of order.

Limestone Dust

that will pass the Baltimore City specifications furnished in 100 pound sacks for asphalt filler.

"Y" Concrete Sockets

are the ideal method of supporting shaft hangers, motors, pipes, sprinkler systems, etc., in reinforced concrete buildings.

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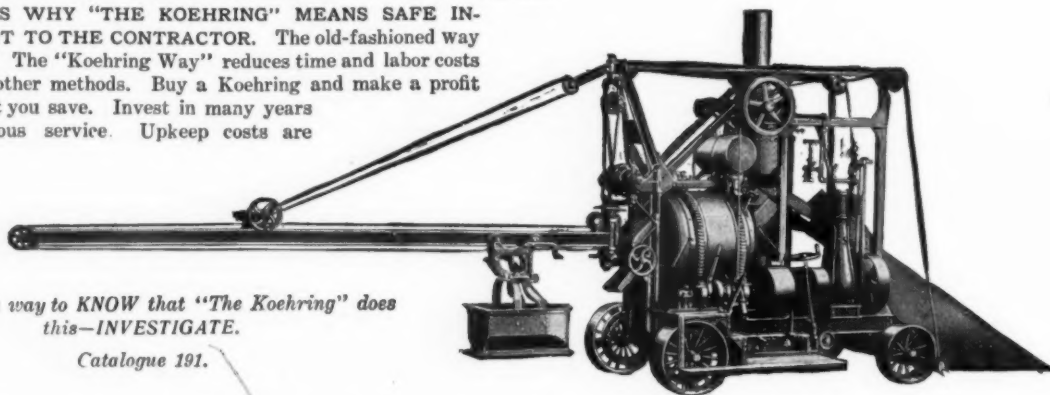
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Catalogue 191.

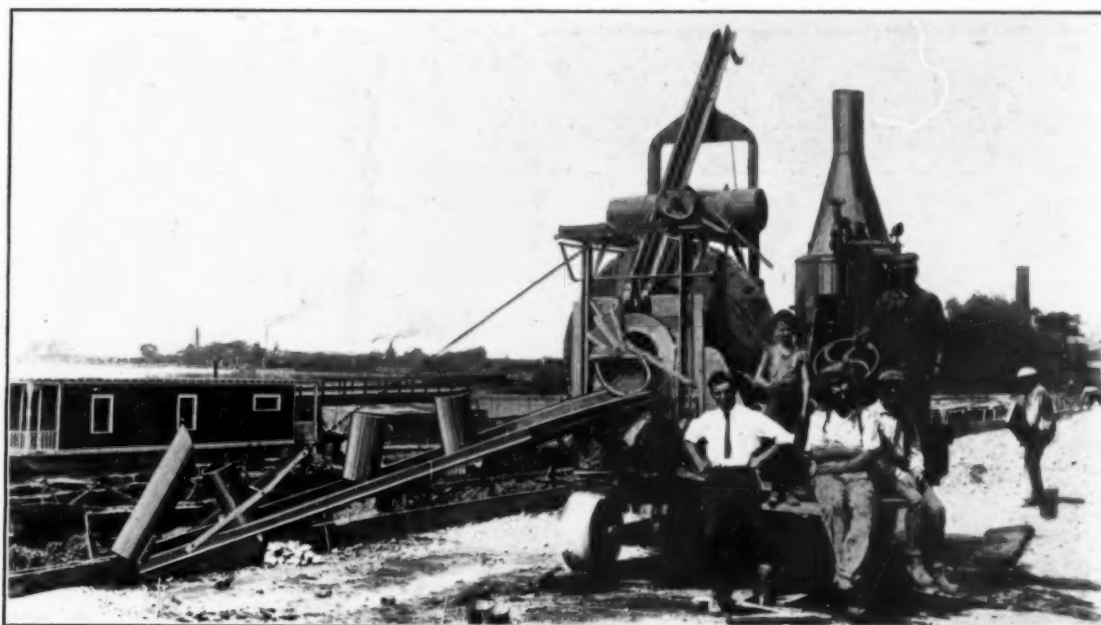
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Foote Batch Paving Mixers

widely and successfully used throughout

Baltimore and the South

The superiority and special features of the Foote Batch Paving Mixers are convincingly shown by the large number of successful paving contractors using them in Baltimore and the South and throughout the United States.



Better
Design

Do Work
Cheaper

Better
Built

Wear
Longer

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P. Flanigan & Sons, Baltimore, Md.
V. A. Paturva & Brother, Baltimore, Md.
Thomas Mullan, Baltimore, Md.
M. J. Beach, Baltimore, Md.
Baltimore Asphalt Block & Tile Co., Baltimore, Md.
D. M. Andrew Contracting Co., Baltimore, Md.
State Roads Commission, Baltimore, Md.
Phillips & Neal, Hurlock, Md.
Chesapeake Construction Co., Preston, Md.
Atlantic Bitulithic Co., Richmond, Va.
Robert G. Lassiter, Oxford, N. C.
R. M. Hudson, Atlanta, Ga.
West Construction Co., Chattanooga, Tenn.
Noll Construction Co., Chattanooga, Tenn.
Southern Paving Cons. Co., Chattanooga, Tenn.

Louis Lawson, Charleston, S. C.
Southern Asphalt & Cons. Co., Birmingham, Ala.
H. N. Bowdry, Birmingham, Ala.
Creosoted Wood Block Paving Co., New Orleans, La.
Pouncey Paving & Cons. Co., Memphis, Tenn.
Roach-Manigan Paving Co., Memphis, Tenn.
Jacksonville Traction Co., Jacksonville, Fla.
C. S. Young Cons. Co., Jacksonville, Fla.
Little Rock Rwy. & Elec. Co., Little Rock, Ark.
E. J. Wetterstrom & Co., Little Rock, Ark.
Healey Construction Co., Meridian, Miss.
Uvalde Rock Asphalt Co., Houston, Tex.
E. J. Overley & Co., Houston, Tex.
Eureka Paving Co., Houston, Tex.
Horton & Horton, Houston, Tex.

P. J. Connelley Co., Houston, Tex.
P. J. Vautrin, Galveston, Tex.
W. A. Kelley Co., San Antonio, Tex.
Rushmore & Gowdy, San Antonio, Tex.
Texas Bitulithic Co., Dallas, Tex.
Municipal Paving Co., Dallas, Tex.
Stone & Webster Engineering Corp., Dallas, Tex.
Klein Brothers Co., Dallas, Tex.
Kuhlman & Blue, Fort Worth, Tex.
R. M. Dunham, Fort Worth, Tex.
Shelby-Downard Asphalt Co., Ardmore, Okla.
Levy & Levy, Muskogee, Okla.
Western Paving Co., Oklahoma City, Okla.
Oklahoma Railway Co., Oklahoma City, Okla.
Municipal Engineering & Construction Co., Oklahoma City, Okla.
Swatek & Parker, Oklahoma City, Okla.
Parker-Washington Co., Tulsa, Okla.

One of these firms owns and operates 8 Foote Batch Paving Mixers; two 7 mixers; a half dozen at least 4 mixers and nearly all 2 mixers. They repeat the order because

"Every Foote a Mixer"

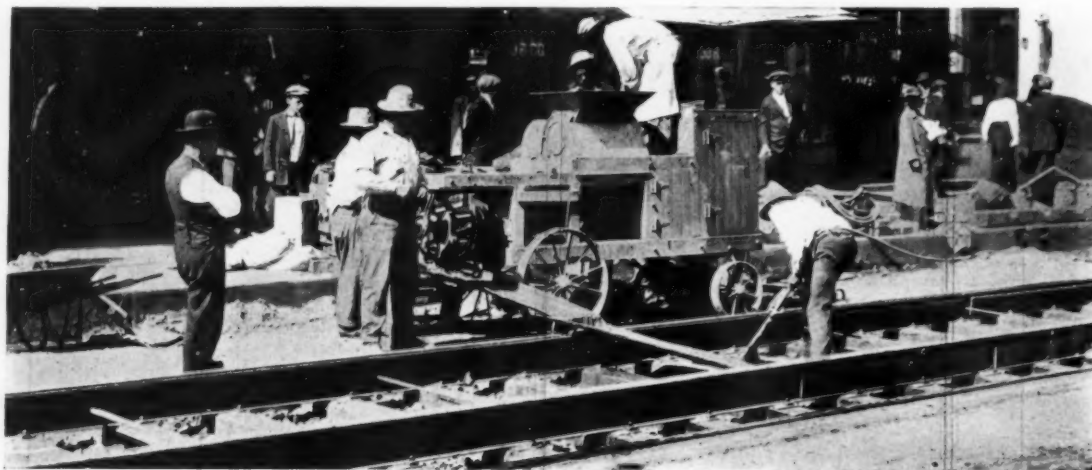
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This illustration shows the Coltrin Mixer mixing cement grouting for United Railways & Electric Co. on Baltimore St., Baltimore.



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A Coltrin Mixer Record in Baltimore

The United Railways and Electric Co., of Baltimore, Md., bought two Coltrin Mixers to mix Cement grouting for the stone ballast under its railway tracks.

The mixing had previously been done by hand and 20 workmen were required.

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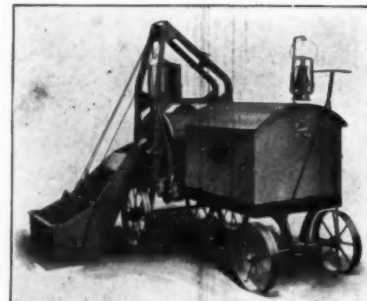
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WHITEHALL was also used in building parts of the \$25,000,000 sanitary sewerage system, likewise in the construction of many buildings and in notable work in all parts of the city.

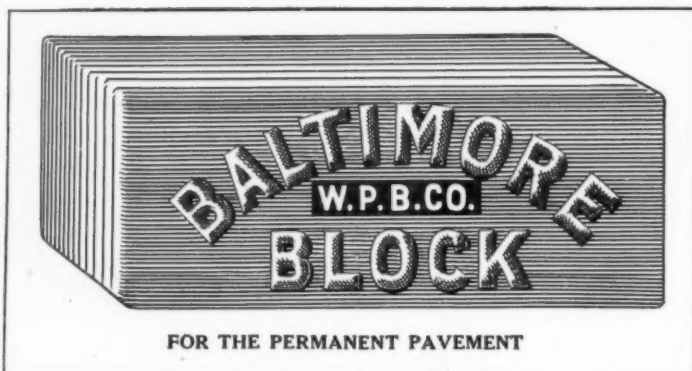
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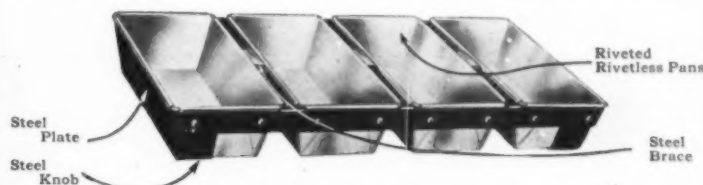
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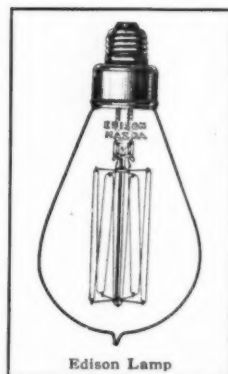
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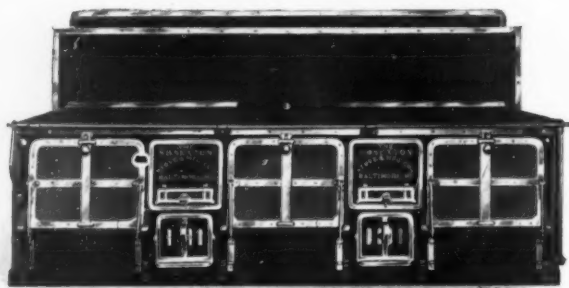
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